S. Grynn,

Steam Rock-Drill.

No. 44,722. Patented Oct. 18, 1864.

Fig. 1.

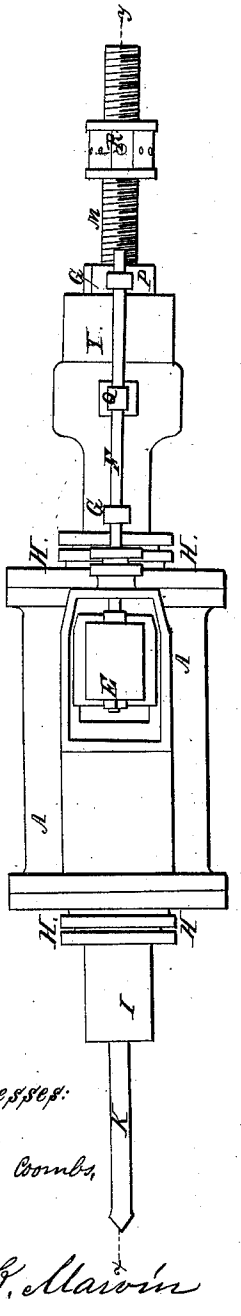
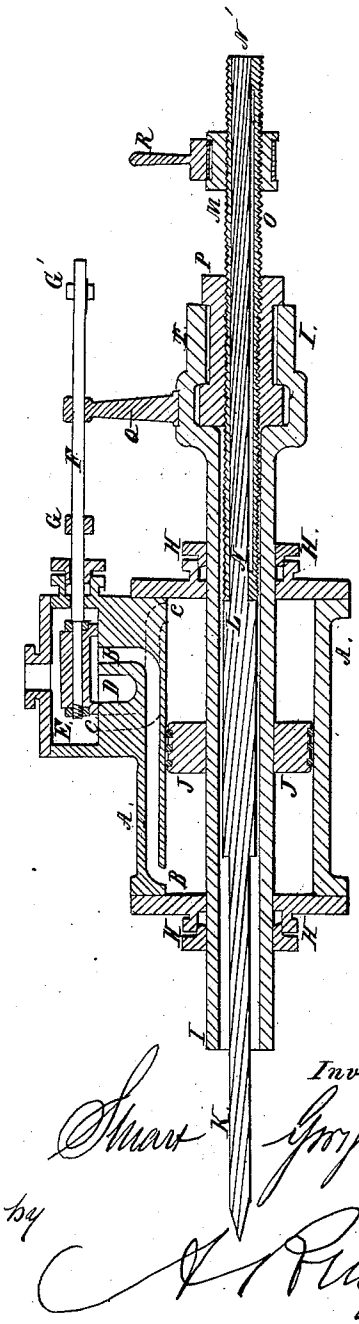


Fig. 2



Witnesses:

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UNITED STATES PATENT OFFICE.

STUART GWYNN, OF NEW YORK, N. Y.

IMPROVEMENT IN PNEUMATIC DRILLS.

Specification forming part of Letters Patent No. 44,722, dated October 18, 1864.

To all whom it may concern:

Be it known that I, STUART GWYNN, of New York, in the county and State of New York, have invented certain new and useful Improvements in Pneumatic Drills; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view of an apparatus constructed in accordance with this my invention, and Fig. 2 is a sectional elevation of the same according to line *x y* in Fig. 1.

In pneumatic drills as heretofore constructed the drill-bar or tool is rigidly connected with the piston or piston-rod of the pneumatic or steam engine, which is arranged to operate the drill-bar in the manner of a churn, and they are therefore denominated "churn-drills." This arrangement has been found in many instances and under certain circumstances to be inconvenient and the source of loss of power.

To obviate these and other objections is the object of this invention; and it consists in the arrangement and construction of a pneumatic drill, in which the drill-bar is allowed to remain in contact with the rock to be bored, and in which the steam or pneumatic action is such as to impart its force to the drill-bar in the fashion of a sledge-hammer when striking a cutting-tool. These drills I therefore denominate "sledge-drills."

To enable others to make and use this my invention, I shall now proceed to describe the construction and operation of a drill made in accordance with this invention and to be operated by steam.

A is the steam-cylinder, or cylinder arranged to be worked by compresssed air or other elastic fluid. It is composed of a flanged cylinder, having on one side a steam or valve chest with ports for the passage of steam or air to and from the cylinder. The port B starts in the chest at the rear end thereof and terminates in the cylinder at its forward end. The port C, on the other hand, starts in the chest at the forward end and terminates in the cylinder at the rear end. The two ports, it will be seen, are situated in two different vertical planes and cross each other, the exhaust-chamber D being arranged between them. The valve E, which is of the cup kind, is operated from without by means of tappets or stops G G′, fast on the valve-rod F. Through the cylinder passes a hollow piston-rod, I, traversing suitable stuffing-boxes, H, in the heads of the cylinder. Upon this hollow piston-rod is mounted the piston J, of ordinary or suitable construction, both the piston and rod being rigidly connected and move in unison when actuated by the power of steam. The drill-bar K, which may be inserted into the socket of a tool-holder, is arranged within the hollow piston rod to freely and loosely play therein. The drill-bar or its holder is enlarged, so as to present a shoulder at L, against which the surrounding screw M, with which the piston-rod is connected, abuts. The drill-bar is prevented from rotating within the hollow screw M by means of feathers N N, fitting the longitudinal groove O, wrought in the drill-bar. This male screw is secured in a female screw-nut, P, which in its turn is secured to the piston-rod I by means of reversible attachment, consisting of an upper and lower flange on the nut, indented in conformity with projections on the piston-rod, the whole constituting a sort of bayonet-catch. To the piston-rod is further attached an arm or lever, through an orifice of which passes the valve-rod, as before described. This lever slides along the valve-rod until it comes in contact at either end ot its stroke with the fixed stops G G′, which causes the shifting of the valve at proper intervals of time for the reversal of the movement and power. Side standards may be applied to this drill in the same manner as I have described in an application of even date herewith. To such standards may be attached an inclined plane, cam, or other equivalent device, with which is engaged a spring-clutch, by means of a tail-piece, R, which causes the clutch when rotated in one direction firmly to grasp the screw and to release its hold upon it when turned in the opposite direction. By this means the screw is advanced automatically within the hollow piston-rod as the work progresses, and the screw by which the blow is given to the sledge drill follows up the drill as it penetrates the rock.

Having thus described my invention and the manner in which the same is or may be performed, I claim—

1. A machine for boring rocks, &c., operated by steam, air, or other elastic fluid, consisting of a cylinder, piston, hollow piston-rod, and

their appurtances, rendering the same self-acting under such an arrangement as that the blow shall be exerted upon a drill-bar or its holder loosely inserted into the hollow piston-rod, allowing the drill to remain in contact with the rock, substantially as hereinbefore described.

2. In pneumatic rock-drills, operating as described, the combination of a loose drill-rod and hammer with an automatic screw-feeding device, so as to follow up the drill as the work progresses, substantially as herein set forth.

3. The method of securing the hollow screw to the hollow piston-rod by means of a reversible nut, constructed and operating in the manner and for the purposes set forth.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

STUART GWYNN.

Witnesses:

EDM. F. BROWN,

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