M. R. RODRIGUES.

TOOL FOR BORING HOLES.

APPLICATION FILED AUG. 17, 1908. RENEWED NOV. 25, 1911.

1,029,824. **Patented June 18, 1912.**

2 SHEETS—SHEET 1.

Fig. 1.

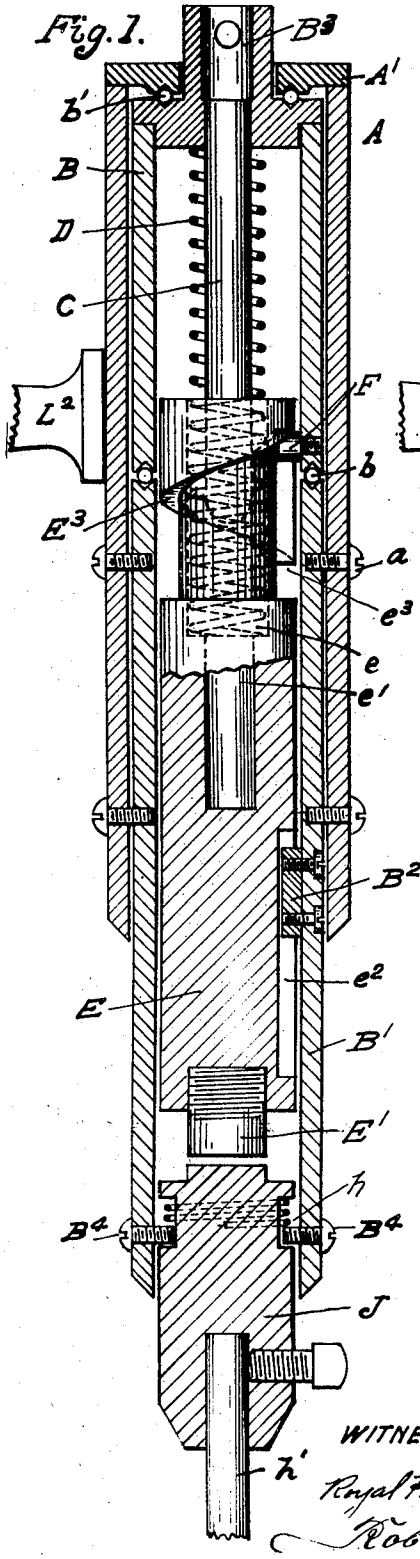
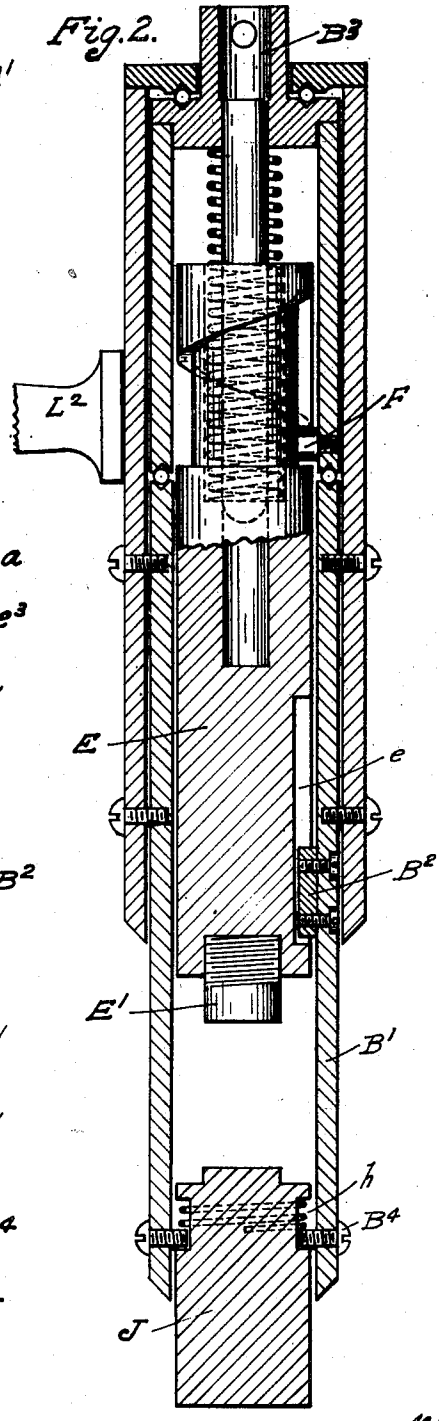


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

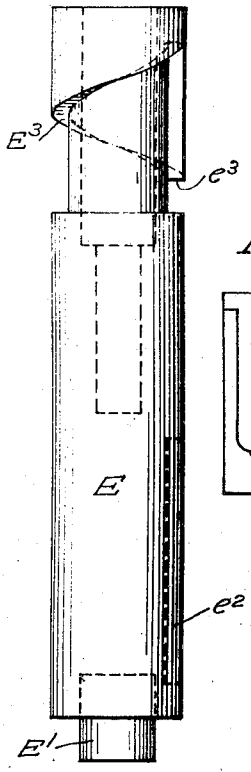


Fig 4

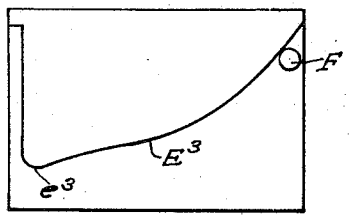


Fig. 5.

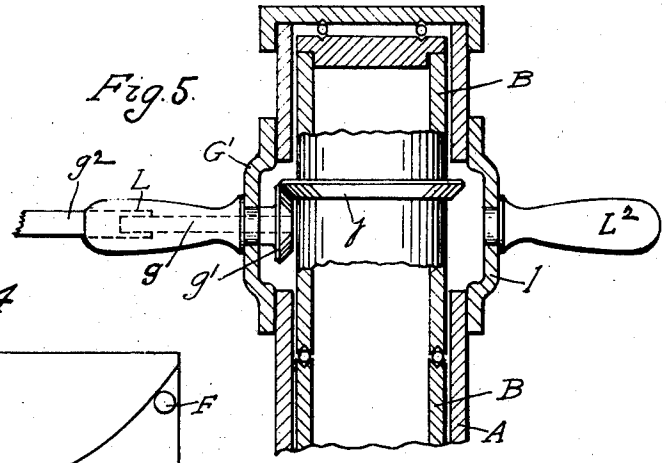
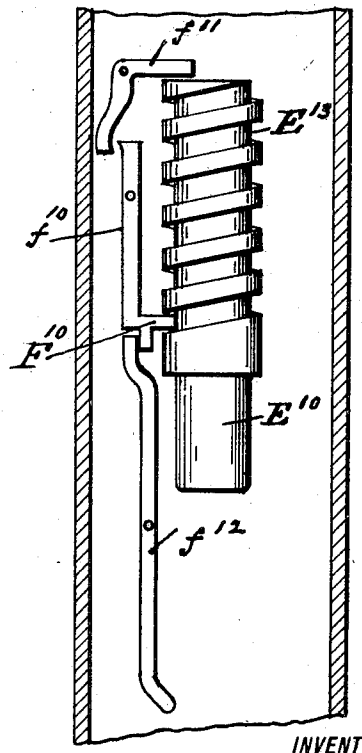


Fig. 6.



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UNITED STATES PATENT OFFICE.

MANUEL R. RODRIGUES, OF BROOKLYN, NEW YORK.

TOOL FOR BORING HOLES.

1,029,824. Specification of Letters Patent. Patented June 18, 1912.

Application filed August 17, 1908. Serial No. 448,796. Renewed November 25, 1911. Serial No. 662,467.

To all whom it may concern:

Be it known that I, MANUEL R. RODRIGUES, a citizen of the United States of America, and a resident of Brooklyn, in the county of Kings and State of New York, have invented a certain new and useful Improvement in Tools for Boring Holes, of which the following is a specification, the same being a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to tools for boring holes in metal, stone or other hard substances, and in particular to machines for perforating stone, metal, etc., as wall drills, which may be operated by means of any convenient or desired source of power, and which embody certain novel features of construction and combination and arrangement of parts; which tools may be also used for various other purposes.

In order to enable the invention to be fully understood, I shall proceed to explain the same by reference to the drawings illustrative of one embodiment of the invention, which accompany and form a part of this specification.

Figure 1 represents a longitudinal section of a drill; Fig. 2 is a similar view showing the hammer in a raised position; Fig. 3 is a view in detail of the hammer piston; Fig. 4 is a diagrammatic view of the guideway, Fig. 5 is a view in section of a shaft connection for the drill whereby the device may be used in connection with a flexible shaft; and Fig. 6 is a partial longitudinal section of the drill.

Like letters of reference indicate like parts in all views.

Referring particularly by reference characters or symbols to the drawings, which represent an instrument embodying my invention in preferred form, A denotes my main cylinder forming the shell of the appliance and having a head A′. Attached to the interior of the same, as, in the present instance, by screws *a*, is a supplemental cylinder B′ preferably extending a suitable distance beyond the end of the cylinder A, and ordinarily having a fin or key B^2 and also interiorly projecting means, as, in the present instance or embodiment, the screws B^4.

A rotatable cylinder B, having a cap B^3 extending upwardly through the head A′, and forming a power head for the attachment thereto, preferably, of a flexible shaft, is mounted between the top of the supplemental cylinder B′ and the lower face of the said head B^3, and preferably works on ball bearings *b*, suitable races being provided for the same. Ball bearings *b*′ are also ordinarily located between the heads A′ and B^3. Within the cap B^3 and preferably secured to the same is ordinarily located a depending guide rod C. D is a spring or other resilient device preferably positioned around the guide rod and between the lower face of the cap B^3 and the bottom of a recess formed in the hammer piston E.

The hammer piston preferably has a head E′ located in the lower part thereof, and is ordinarily formed with a recess *e* to contain the spring D, and also with a smaller and relatively lower recess or bore *e*, adapted to receive the guide rod C, when the hammer is moved upwardly, and also has a keyway e^2 in which works the key B^2, the said hammer piston being thus mounted in and slidably supported, in a non-rotative relation, by the cylindrical shell B′.

In order to provide for a reciprocatory movement for the hammer piston, I preferably form in the upper part of the same a slideway, track, cam edge, or marginal guide E^3, along which works suitable engaging means as a pin F ordinarily projecting interiorly from the rotatory cylindrical shell B.

The guide or way E^3 is ordinarily partly of spiral form and of any suitable inclination and length, and at the lowest point e^3 of the same it is preferably turned with a gentle curve in a vertical direction, and is so formed that the preferably rotatory pin F, which ordinarily travels in one plane, will successively and continuously travel along the continuous path formed by the spiral and approximately vertical portions of the preferably non-rotatory guide or trackway E^3, thereby causing the preferably non-rotatory hammer piston E to alternately rise and compress the spring D, and afterward to fall with a sudden movement, the impact or force of the blow thus struck by the hammer being regulated by the tension and size of the spring D.

At the lower part of the casing B′ is located an anvil J made with an annular groove *h* of sufficient length to afford the vertical movement desired, in which groove

the screws B^4 may work. The depending portion of the anvil may be adapted to form a chuck in which a tool, as the drill tool h', may be mounted in order to turn and slide with the said chuck. The chuck is thus mounted in and slidably supported by the shell B′, preferably in the manner shown, and the said tool and chuck may be turned, manually or otherwise, a short distance on its vertical axis at each stroke of the hammer piston. Manifestly the relative action and reaction of the pin F and the hammer piston E, through the guideway or track E^3, may be varied, as for example, the said pin may, as heretofore inferentially stated, be held stationary and the hammer piston rotated.

An electric motor, flexible shaft, or other desired motive power may be connected in an operative relation with the head B^3 by means of a set screw or other suitable device.

It will be seen that, in accordance with the preferred construction shown, the shells A and B′ will be stationary in the operation of the appliance, the cylinder B, power head B^3 and pin F will rotate in unison, and the piston hammer E will work with a reciprocatory action, while the chuck J is free to be turned manually or otherwise.

The shell is ordinarily held in the hands of the operator, and, upon power being applied to the rotary head B^3 at the upper part of the shell, the piston hammer is raised against the tension of the spring and afterward released and caused to impact the drill cylinder at the free end of the shell with a sharp blow.

In the tool shown in Fig. 6, the cylinder B is provided with a bevel gear j which meshes with another bevel gear g'. supported by bearings in a bracket G′ through which is passed the shaft g, adapted to engage a shaft connecting device L made in the form of, and adapted to serve as, a handle, and constituting the holding means for the terminal of a flexible shaft g^2 which is engaged with the shaft g. A bracket l located on the other side of the tool serves to support a handle L^2 similar to the one shown in Fig. 1.

The cylinder B is rotated, and serves to actuate the hammer in the manner shown in Fig. 1.

The track or guideway is preferably made so that it will go at a sharp incline from the pin F when the spring is relaxed for a greater part of the length of the hammer piston E, as shown in Fig. 4, in order that the spring may not have to move the said piston but a relatively short distance when under compression by the movement of the parts.

In the structure shown in Fig. 7, the track or guideway E^{13} of the hammer piston E^{10} is made longer and of a spiral form and is engaged with the pin F^{10} located at the lower end of a pivoted lever f^{10} which pin is released from engagement with the hammer piston E^{10} by the impact of the same with the upper end of the bell crank lever f^{11}, the lower extremity of which is constructed and arranged to engage the upper end of the pivoted lever f^{10}. Upon the descent of the hammer piston it impacts the lower end of a pivoted lever f^{12} by which action the upper arm of said lever is caused to strike the lower extremity of the pivoted lever f^{10} and to thereby force the pin F^{10} into engagement with the guideway of the hammer piston.

The concussion tool described may be advantageously used in chipping castings, stone, etc., or for riveting metal bodies together, or for a center punch, or wherever it is desired to produce a sharp blow or a series of concussions, as for example in ramming or tamping plastic or other material, in which cases a hammer having a flat head as shown in Fig. 2 may be used.

I wish it to be understood that I do not desire to be limited to the exact details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

What I claim as my invention is:—

A tool comprising a cylinder having a non-rotatable, vertically movable cam, and a power actuated rotary means surrounding the cam and formed with means located at one end thereof to engage the cam, and a hammer head positioned below the said cam and located at the lower end of the cylinder, a reciprocatory hammer piston located above the hammer head, and connected with the cam, a guide rod located interiorly of the cam, a spring surrounding the guide rod and located above the cam to actuate the same, the whole being contained within the said cylinder.

In testimony of the foregoing specification I do hereby sign the same in the city of New York county of New York and State of New York this 19th day of June 1908.

MANUEL R. RODRIGUES.

Witnesses:
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J. ODELL FOWLER.