P. T. WIGHTMAN & H. VAUGHAN.

STONE DRILL.

No. 5,358. PATENTED NOV. 6, 1847.

Fig. 1

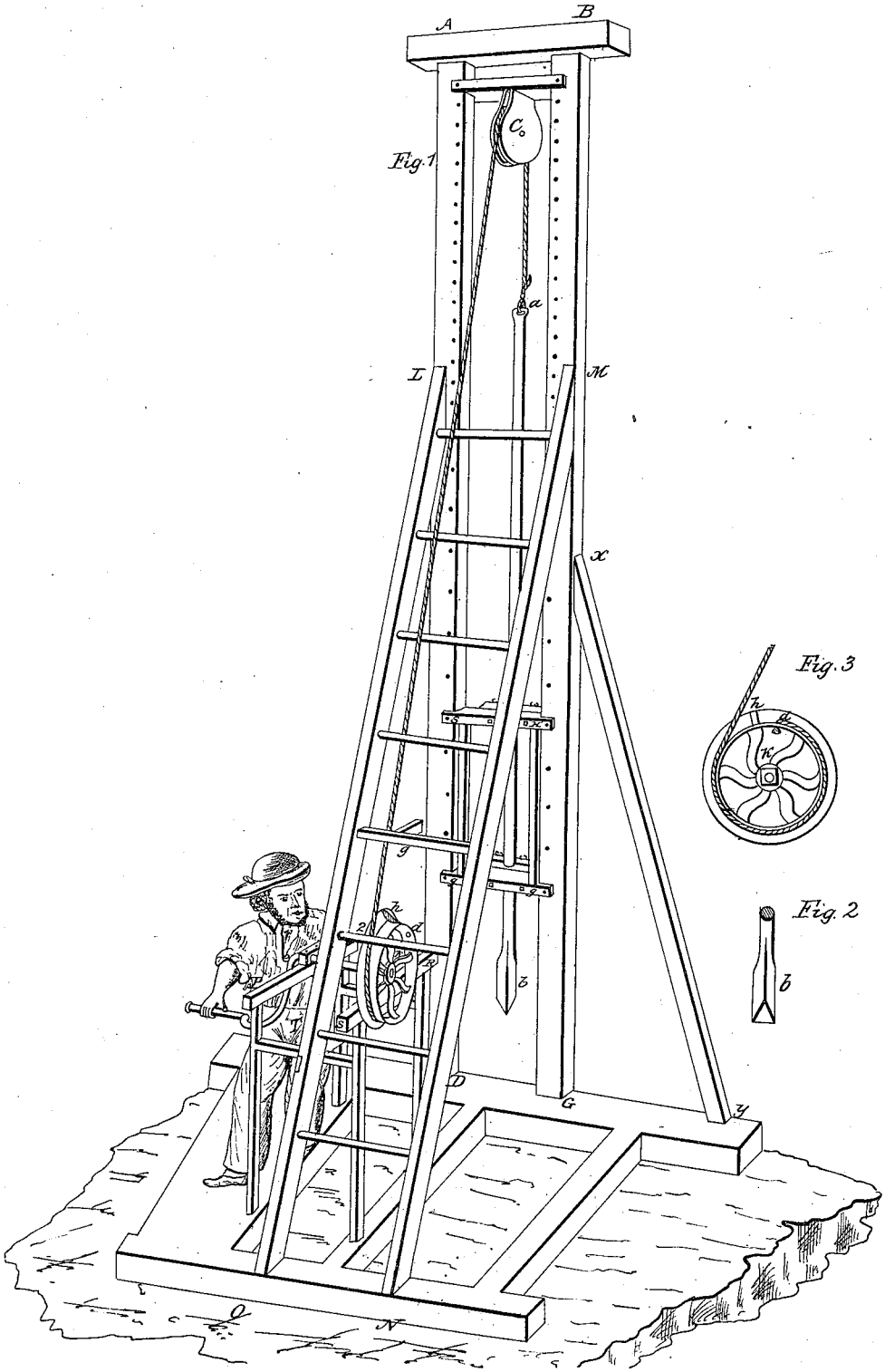

Fig. 3

Fig. 2

UNITED STATES PATENT OFFICE.

PARDON T. WIGHTMAN AND HORACE VAUGHAN, OF EAST GREENWICH, RHODE ISLAND.

MACHINERY FOR DRILLING ROCK.

Specification of Letters Patent No. 5,358, dated November 6, 1847.

To all whom it may concern:

Be it known that we, PARDON T. WIGHTMAN and HORACE VAUGHAN, both of East Greenwich, in the county of Kent, State of Rhode Island, have invented a new and useful Machine for Drilling Holes in Ledges of Rocks for Blasting; and we hereby declare the following to be a full and exact description thereof.

A B C D represents a strong upright frame work with holes bores through each post as represented by the dots on the same in the annexed drawing which is made part hereof, these holes above the points L, M, being half the distance apart that they are below L, M.

E, F represents a strong cross piece with a jaw at each end fitting to, and sliding up and down on each post and may be fastened to each of the holes by pins passing through the posts and cross piece. The object and use of this is to sustain the table and drill and is made movable to adapt its height to the depth of the drill hole.

G, H, and I, J, represent two other cross pieces of the same general description. These two last cross pieces are framed together by pieces of joist on the inside of posts A, B, C, D, and both made with jaws and to slide up and down on the posts and to be fixed at any point by pins passing through them and the post is as done with E, F. Attached to the front side of both of these cross pieces G, H, and I, J, is a piece of wood with a hole through the center for the drill to pass through these pieces of wood thus attached and divided in the center (to open and shut like the clamp of a vise), so as to take off the front half and take out the drill. They may be made of wood or iron, and are fastened to the cross pieces E, H, and I, J, by bolts, with nuts or thumb screws. The use of both these cross pieces and attachments is to guide and steady the drill in its motion. When I, J, has been lowered so as to be fixed in the holes in posts next above letters C, D, and the hole has been drilled so deep that the top of the drill when it has descended, will touch or nearly so, the cross piece and its attachment G, H, both parts of the attachment to G, H, making the hole through which the drill passes, may be taken off, (leaving the cross piece G H) so that the top of the drill may descend to the cross piece at I, J, when fixed nearest above points C, D.

a, *b*, represents the drill of iron, nine and a half feet in length, square for from four to six inches from the point *h*, two and a half inches square above, one and one half inch in diameter, the edge is made diagonally from two of the corners, and the two other corners being cut or shaved down to the edge at its lowest point for from one inch to one and a half inches from the same lowest point, see both drawings representing both views of the lower end of the drill. The drill may be all in one solid rod with steel at lower end, or it may be in two parts with a socket and screw and to be separated at any desirable point. At *a* there is a hole in the end of the drill through which passes a leather strap with a buckle to unfasten easily; to the strap is attached a rope made of cotton, hawser laid, about two and a half inches in circumference which passes over pulley at *c* and then passes down to wheel K and is attached to it by passing through a hole in the rim of the same at *d* and is fastened by a knot on the under side of the rim. X, Y, is a brace merely to support the frame.

L M N O, is a ladder to go upon the lower cross piece E, H, and to unfasten drill and serves also as a support to A B C D.

P Q R S, represent a frame work for support of crank *e*, *f*, and wheel K, and is firmly attached to A, D, and thus serve mutually to support each other. *g* is a small piece of wood passing from A D to a slot in the ladder and its use is to prevent the rope from flipping or swinging in toward A D, as the flange on the wheel K prevents its doing in the opposite direction. K represents an iron wheel fixed on the end of the shaft *e*, *f*, so that the inner edge of the rim is in a line with the end of the shaft at *f*. K is sixteen inches in diameter (the inventors also use a wheel of thirteen inches diameter with a machine of the size in the drawing and use different sized wheels according to size and weight of drill) with the whole width of the rim about two inches. At the distance of one third of the width of the rim from the outer edge is a flange raised around the whole rim, about two inches, its upper edge turned over toward the outer edge of the wheel. The use of this flange is to prevent the rope when wound

up on the wheel, from slipping off on the outside of the wheel.

h represents a small piece of wood or iron, triangular in form somewhat, from one inch to one and a half inches in length its under surface shaped to fit the upper or outer surface of rim of the wheel, its surface next to and touching the flange of the wheel fitted to the flange and its upper or outer surface smooth (and a little rounding upward) from the top of the flange to the inner edge of the rim of the wheel; its use is, when the wheel has been made to revolve and the rope comes around and in contact with this block of wood or iron, to throw the rope off the inner edge of the rim of the wheel and so let the drill, raised by the revolution of the wheel, fall at once the entire distance it has been raised by one revolution of the wheel, and then the drilling is done; this block of wood or piece of iron may be made to move on the rim of the wheel by boring holes through it and the rim of the wheel and screws to fasten at the different points; it is usually placed near the hole in the rim where the rope passes through and is fastened. Where the rope passes through the rim of the wheel at *d*, it also passes through a thimble on the under side of the rim of the wheel, the edge of the thimble fitting the under surface of the rim of the wheel which being smooth turns around with the knot of the rope in it, easier than the knot would without the thimble; its use is, to prevent the rope becoming too hard twisted by the revolution of the wheel. One end of the rope being fastened in the strap at the upper end of the drill *a*, and the other end fastened through the rim of the wheel and the thimble by the knot, let the crank and wheel be turned; the drill is raised with this wheel, about four feet and continues to rise till the rope comes in contact with the block of wood or iron at, *h*, and then the rope is thereby thrown off the inside of the wheel and the drill falls upon the rock doing great execution. The form of the drill at the lower end and with the edge as hereinbefore described, makes the drill hole round, and the square form of the drill prevents its catching in any seam in the ledge, which was a course and source of much trouble in drilling ledges with the common former drill. The revolution of the wheel K and the winding of the rope upon it, twists the rope so hard that the drill by the untwisting of the rope is caused constantly to turn around in its motion, thereby keeping the drill hole round and is prevented from being twisted too hard by the thimble under the rim, which being fitted to turn easy against the under side of the rim of the wheel relieves the rope from too hard a twist. Drills of different sizes, weights and length may be used to suit the wish of the operator and the nature of the work to be done.

What we claim as our invention and desire to secure by Letters Patent is—

The combination of the drill, herein described, with the wheel and inclined block, by means of the cord, whereby the drill is elevated turned and dropped.

PARDON T. WIGHTMAN.
HORACE VAUGHAN.

Witnesses:
GEO W. BROWN,
R. G. BROWN.