J. M. May,

Artesian Well Drill.

No. 50,020. Patented Sep. 19, 1865.

Fig. 1.

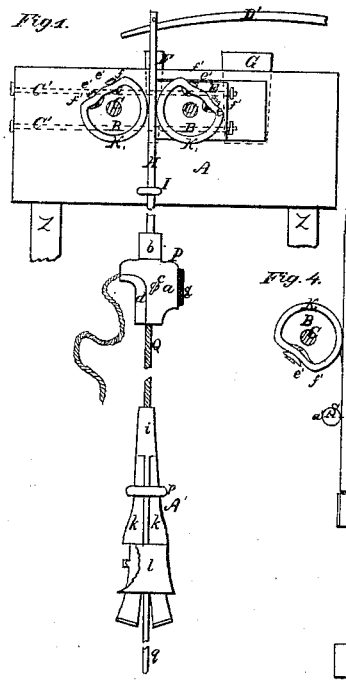

Fig. 2.

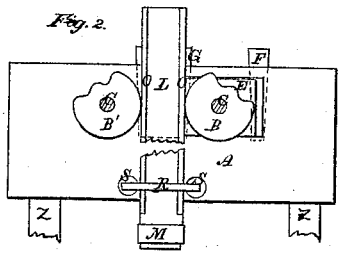

Fig. 3.

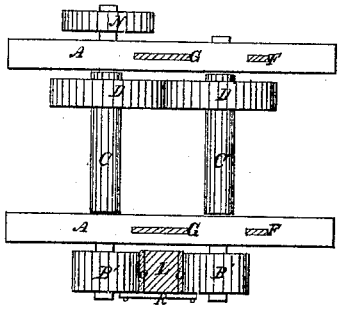

Fig. 4.

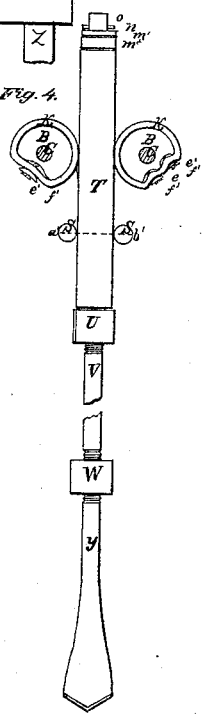

Fig. 5.

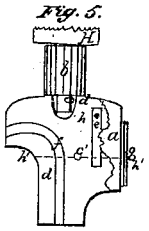

Fig. 6.

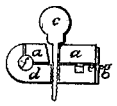

Fig. 7.

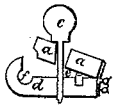

Fig. 8.

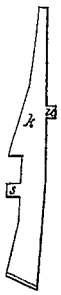

Fig. 9.

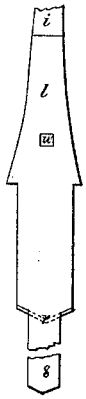

Fig. 10.

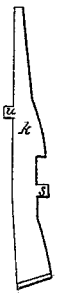

Fig. 11.

Witnesses

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UNITED STATES PATENT OFFICE.

JOHN M. MAY, OF ROCK COUNTY, WISCONSIN.

IMPROVEMENT IN ROCK-DRILLS.

Specification forming part of Letters Patent No. **50,020,** dated September 19, 1865.

To all whom it may concern:

Be it known that I, JOHN M. MAY, of Rock county and State of Wisconsin, have invented a new and useful Improvement in Rock-Drills and Machinery for Operating Rock-Drills, and for analogous purposes; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention relates to a rock-drill by which, by a slight change, the same drill may be used for drilling, or drilling and reaming or enlarging the drilled hole; also, to operate a rock-drill by means of cams or broken pulleys faced with elastic material that gripes between them as they are revolved a non-elastic or rigid bar to elevate the drill and set it free when the broken or lean part of the pulley is reached; also, in using metal-faced broken pulleys with a non-elastic bar, having its sides that come in contact with the pulleys clothed with a strip of elastic material, for lifting and setting free a drill; also, in using a hollow bar operated between broken pulleys, the bar receiving a round drilling-rod, by which a swivel is formed to allow the drill to be revolved in a horizontal direction as the work of drilling progresses; also, in a peculiar mode of fastening elastic facings to the face of a metallic broken pulley used for operating a rock-drill, or a hammer for other purposes, as pile-driving, driving fence-posts, and for analagous purposes; also, in clothing with elastic strips, as leather or rubber, the sides of a non-elastic bar that come in contact with the metallic faces of broken pulleys used for lifting and setting free rock-drills and other weights; also, a circular gripe or vise for holding a rope attached to a drill, whereby by opening the vise the rope is lengthened as needed as the drilling progresses, the vise being attached by a swivel to the bar that passes between the broken pulleys by which the drill is operated; also, so forming the frame-work of a drilling-machine that the space between the pulleys may be readily enlarged or diminished to receive a thin non-elastic bar or a square bar used in operating a drill.

In the accompanying drawings the same letter of reference in each figure represents the same part.

Figure 1 is an elevation showing a portion of the frame-work of the drilling-machine, including the cams or broken pulleys, the edge of a non-elastic bar between the pulleys, a gripe or vise to hold a rope, and a drill attached to the rope. Fig. 2 is a modification of Fig. 1 when used as a pile-driving machine, the pulleys being metallic-faced, and the sides of bar between them being provided with a yielding surface. Fig. 3 is a top view of the machine, showing the pulleys, shaft, and gear by which the pulleys are revolved. Fig. 4 is a view of a hollow square bar between pulleys, the spindle of the drill passing through the bar longitudinally, forming a swivel for the drill. Fig. 5 is a side view of the vise with one of the jaws broken partly away. Fig. 6 is a transverse section of the vise from h' to h' in Fig. 5. Fig. 7 is the same view of the vise with the jaws open. Figs. 8, 9, and 10 are detail drawings of the drill, shown in Fig. 1. Fig. 11 is a horizontal cross-section showing the hollow bar and spindle of a drill represented in Fig. 4.

In Figs. 1, 2, and 3, A is the frame-work on which the shaft C and cams or broken pulleys B and B′ are placed in proper box-bearings, the box-bearings for one shaft being movable by means of keys G and F or screw-bolt C′, for the purpose of giving the desired pressure of the broken pulleys on the bar H in Fig. 1, or L in Fig. 2, or T in Fig. 4, that pass between the pulleys, lifting and setting them free, as the machine is operated. This frame work is made in any proper manner, posts, as Z, extending to sills or posts planted in the ground.

K in Figs. 1 and 4 is a band of leather, india-rubber, or other suitable material, that incloses the face of the pulleys, and is strained and made fast to the pulley by means of screw e' and bar or washer f, through which bar the screw passes and draws the band into the concave or space in the pulley, straining the band on the face of the pulley; or this fastening and straining the band on the face of the pulley may be done in any suitable manner, the band

on the face of the pulley serving the purpose of grasping with certainty the metallic or wooden bar that passes between the pulleys, and gives great durability to both pulley and bar.

Pulleys B′ in Figs. 2 and 3 are metallic-faced, and the bar L is faced on its sides next the pulleys with strips of leather or rubber O, or other suitable material, this bar having band M near its bottom, and is used for driving piles, fence-posts, and for similar purposes.

It will be observed that the pulleys and shafts are farther asunder in Figs. 2 and 3, (also in Fig. 4,) to receive the large bar, while in Fig. 1 they are near enough together to receive and grasp the flat bar H.

D D, Fig. 3, are gears, and may be cog, friction, or other gear, to cause the pulleys to operate in unison.

The bars H, T, and L are kept in line perpendicularly by guide I in Fig. 1, or by friction rollers S S and bar R in Figs. 2, 3, 4, and 11, or may be kept in line as the bars rise and fall in any suitable manner. The lower end of bar H terminates in a proper form to enter the socket *b* at upper end of gripe or vise P, where it is held by pin *d′*, or in any suitable manner, to form a swivel and to allow the vise, rope Q, and drill A, attached, as shown, to bar H, to revolve horizontally and rise and fall perpendicularly at the same time as the machine and drill are operated.

The vise is for the purpose of grasping the rope at any place, as it needs to be lengthened or shortened, as the process of drilling and pumping progresses.

Vise D is shown in Figs. 1, 5, 6, and 7, and has jaws *a* and *d*, hinge *g*, and also spring *e* to press apart the jaws as the thumb-screw *c* is used to open and close the jaws, the rope being firmly griped by the jaws *a* and *d* in the slight circular groove *f*, the groove being of suitable size to partly receive the rope without materially altering the round shape of the rope, and yet hold it firmly within the jaws. This vise may be used when the drill is operated by a working-beam or otherwise.

The drill A, Fig. 1, is a compound drill or butt tool, with trimming-band *l* and members *i k k*; and band *p*, also *i k k*, are shown in detail drawings, Figs. 8, 9, and 10.

T in Figs. 4 and 11 is a hollow bar that is lifted and set free by the pulleys B, with spindle *u* passing through it longitudinally, the socket U forming a shoulder at its lower end, and its upper end has rubber or other spring *m*, washer *m′*, and pin *n*, by which as the pulleys lift the hollow bar the drill is also lifted, the spring *m* serving to relieve the concussion as the pulleys suddenly grasp the bar as it is lifted, the operation of lifting and setting free the drill and its connections being very rapid as the process of drilling progresses.

It may be observed that the central member, *i*, has a narrow portion, *y*, extending downward. This is for the purpose of following as a guide a small drilled hole when the drill is used as a reamer to enlarge a small drilled hole; and by omitting (as at dotted line in Fig. 9) the part *y* a drill for original work is produced; or there may be two central members *i*, one with and one without the part *y*, so that it may be used in either capacity, as a reamer or as a drill, or it may be used (including the portion *y*) as a drill to make a small and enlarged drilled hole at the same time.

Y in Fig. 4 is a common flat drill, but any kind of drill may be used in its stead, and is connected, by socket U and W and connecting-bars V, to the spindle *o* that passes through bar T. Spring D′, at the upper end of the bar H or T or L, is to aid in keeping the top of the bar still and give it an easy motion, as the motion of the drill is reversed as it reaches its highest and lowest point at each stroke. The spring may be of wood, metal, or rubber, and of any desired style and strength.

One advantage of clothing the broken pulleys B with the band K is to provide a slightly-yielding surface, whereby the difficulties consequent on a metallic surface of a pulley coming in contact with a metallic or wooden bar to be rapidly lifted and set free by the movements of the pulleys are obviated, for when the pulleys revolve and the drill is lifted until the flattened or broken-away portion of the pulleys is reached, when the drill and its connections fall by their own gravity, are at once caught by the full surface of the pulleys to again lift them, and unless there is a surface somewhat yielding, as the power is first applied to overcome the inertia of the drill and its attachments, an abrasion and wear is sure to result; and to prevent this I clothe the pulleys or the slides of a non-elastic bar, substantially as described, with leather or rubber or other suitable elastic material.

I am aware that cams or broken pulleys with metallic surfaces and an elastic strap, as in the patent issued to L. M. Gilmore and John M. May, dated September 11, 1860, have been used, and I do not claim broken pulleys and an elastic strap to lift and set free a drill.

I am also aware that a straight gripe for holding a rope has been used when connected with a working-beam for lifting and allowing a drill to descend, and I do not claim, broadly, a gripe for holding a rope; but

What I do claim in my invention, and desire to secure by Letters Patent, is—

1. Covering the face of broken pulleys used to lift and set free drills, and for other similar purposes, with leather, india-rubber, or other suitable slightly-elastic material, substantially as and for the purposes deseribed.

2. A non-elastic or rigid bar faced with leather, rubber, or other suitable elastic material on its sides next to metallic pulleys, when used with metallic-faced pulleys, substantially as and for the purposes described.

3. A hollow bar to receive the spindle of a drill, when the hollow bar is operated between

broken pulleys, the hollow bar and spindle serving as a swivel to allow the drill and spindle to be revolved horizontally at the same time it is operated vertically as the drilling process progresses.

4. A gripe or vise connected by a swivel to the operating mechanism of a drill, when the vise is constructed substantially as and for the purposes described.

5. The general arrangement of the pulleys B′ B′, bar L, shafts C C, guides S S and R, when combined and operated substantially as and for the purposes described.

6. Elastic washer *m*, of rubber or its equivalent, between the top of bar T and washer *m* in Fig. 4, when used as and for the purposes described.

JOHN M. MAY.

Witnesses:
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S. D. LOCKE.