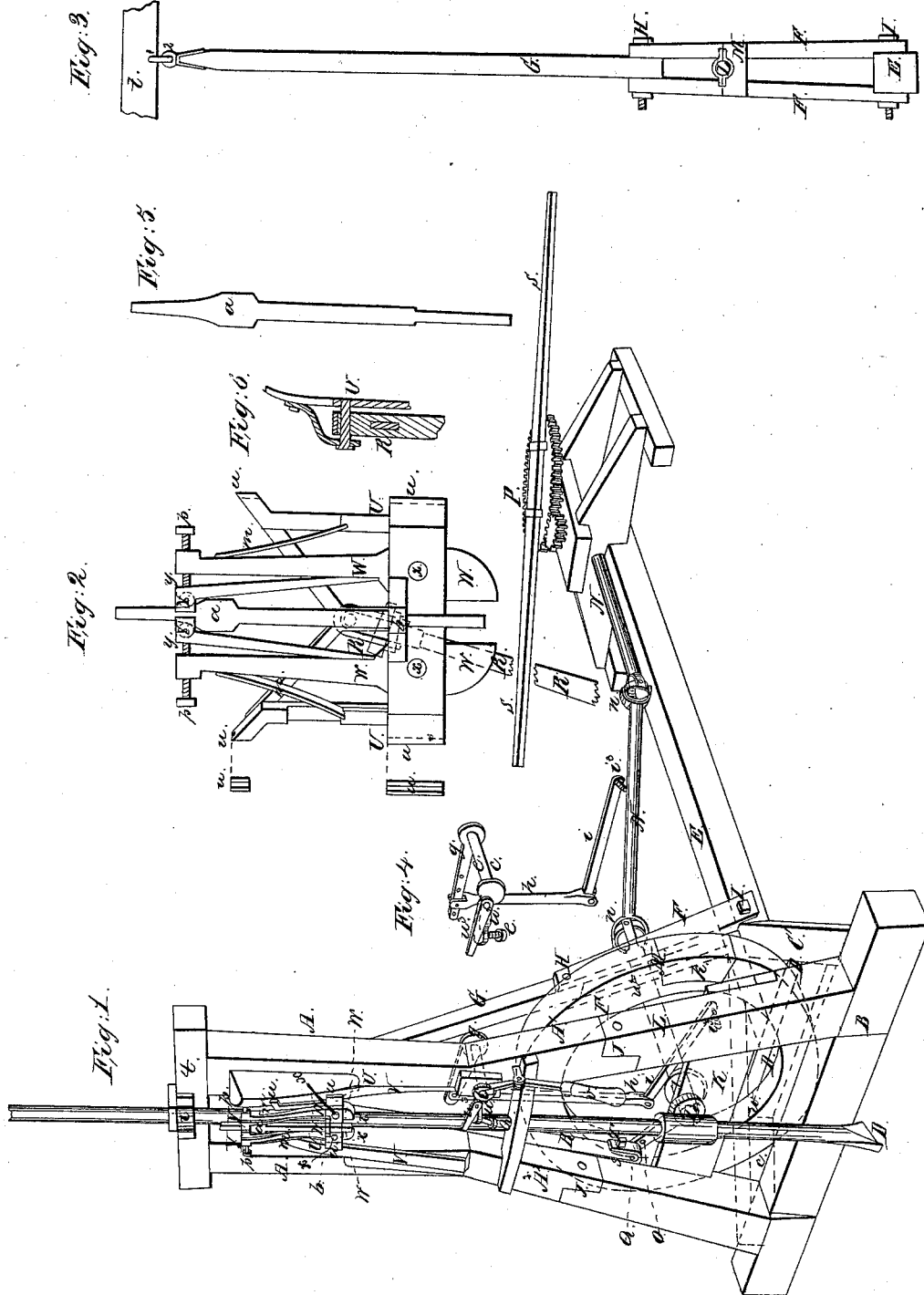


Scoville & Avery,

Stone Drill.

N^o 4,180.

Patented Sep. 9, 1845.



UNITED STATES PATENT OFFICE.

HIRAM H. SCOVILLE, OF DES PLAINES, ILLINOIS, JOINT INVENTOR WITH W. AVERY, OF
SAME PLACE.

MACHINE FOR DRILLING ROCK.

Specification of Letters Patent No. 4,180, dated September 9, 1845.

To all whom it may concern:

Be it known that I, HIRAM H. SCOVILLE, of Des Plaines, Cook county, State of Illinois, surviving partner and inventor with
5 WILLIAM AVERY, deceased, of the same place, have invented a new and useful Machine for Drilling Rocks, &c., and do hereby declare that the following is a full and exact description thereof, reference being had to the
10 annexed drawings, making part of this specification.

Figure 1 is a perspective view of the machine. Fig. 2 is a front view of the winding cross head, jaws, springs, wear irons,
15 &c., drawn on an enlarged scale. Fig. 3 is a view of the braces hid by the wheel and posts in Fig. 1. Fig. 4 is a view of the axle arms and rods for operating the wedge. Fig. 5 is a view of the wedge detached from
20 the machine. Fig. 6 is a sectional view showing the connection of the pitman rod with the cross head.

This machine is so constructed as to be operated by a horse-power, connecting rods, and universal joints; and to lay hold of the
25 drill by jaws and raise it to a sufficient height, when the jaws are made to open by a wedge or key *a* striking against a loop *b* attached to the frame and let the drill fall; having
30 also a horizontal circular movement produced by winding or spiral guides *V* fixed to the frame.

The frame, lettered *A, A*, is composed of two posts *A¹ A²*, about nine feet in length,
35 let into a sill *B*, and united at top by a cap *t* the lower five and a half feet of said posts standing at an angle of about 80 degrees with a horizontal plane; and the upper three and a half feet being perpendicular,
40 at the distance of about 12 inches apart. The sill should be about 8 feet long; to the back of which are secured two oblique sills *C C'* united by a short cross sill *D*, running parallel to sill *B*, near their outer ends. Between
45 the ends of the sills *C C'* is placed a long horizontal timber *E*, extending back to the horse power *P*, over which the latter is constructed. Two short braces *F F*, Figs. 1 and 3, are attached to the horizontal timber
50 *E* by a horizontal transverse bolt *I*, passing through the said braces and timber; and on which bolt these braces move as the angle of the drill is changed. Between these
55 braces is placed a long brace *G*, secured by a bolt *H*, and extending to the back of the

cap *t*, to which it is attached by a hook 1 and eye 2 (see Fig. 3). The position of the drill *D* is changed from a greater to a lesser angle with a horizontal plane by having
60 rolling joints *J J* in the posts *A¹ A²* of the frame *A A* of the drill *D*, and the jointed braces *F G*, Figs. 1 and 3.

A horizontal girt *K* is fastened to the uprights *A¹ A²* of the frame below the rolling joints *J*, on which girt and a short girt
65 *M*, Fig. 3, attached to the braces *F F*, Fig. 3, is placed the shaft *L* of the balance wheel *W*, to which shaft are connected the universal jointed coupling shafts *N N* extending to the horse power *P*. A crank *O*, Fig. 70
1, is fixed on the front end of said shaft *L* on which crank there is a wrist *Q*; and this wrist is connected to the pitman *R* by means of a strap *S* and key *T*. This pitman is connected in the same manner to a cross
75 head *U*, which moves up and down between the posts *A* having at the same time a horizontal circular movement produced by winding guides *V V*, Fig. 1, placed on the inner
80 sides of said vertical posts *A A*. This cross head *U* is made of wrought iron and placed betwixt the winding guides *V V* having grooves in the sides or corners of the said
85 cross head at *W W W W*, Figs. 1 and 2, corresponding with the said winding guides over which they move in rising and falling. In this cross head are placed two perpendicular jaws *W W* turning on cast steel
90 pins *X* passing through the cross head and the jaws. These jaws are 18 inches long; to which, on the inside are attached irons *Y*, having in their upper ends grooves, in which are placed steel rollers *y, y*, against which
95 a steel wedge *a* moves for moving the upper or longer portion of said jaws outward and simultaneously closing the lower or shorter arms of said jaws inward against the drill, the lower end or shank of said wedge *a* slipping through a loop *b* fastened to the cross head. This wedge acts on the jaws in
100 closing them by having its downward motion arrested by an arm *u³* made in two parts, see Figs. 1 and 4, fastened to the front end of an axle *c* which passes through the post *A¹*, having fastened on its back or
105 inner end another arm *g*, to the extremity of which is attached a vertically descending connecting rod *h*, attached to an arm *i*, Figs. 1 and 4, turning on a pin *i³*, Figs. 1 and 4, inserted horizontally in the girt *K*; 110

which arm is raised by a cam *j*, Fig. 1, on the shaft L of the fly wheel *w*.

A counter balance *k* of lead or other heavy material is fastened on the periphery of the wheel *w* to aid in lifting the drill and causing a steady motion. A screw *e* passes through the outer end of the lower arm *u*², and presses against the underside of the upper arm *u*³ which arm *u*³ is hinged to the lower arm *u*² in order to regulate the distance of the movement of the wedge more or less by causing it to move more when said arm *u*² is raised and less when lowered.

A loop *l* is fastened horizontally against the front of the cap *t* for arresting the upward motion of the wedge.

Two springs *m m* are arranged or placed against the inner side of the cross head and press against the backs of the jaws W, W, for closing their upper ends.

Two small set or gage screws *p p* are placed in the top of the jaws for forcing up the wear irons Y as the rollers *y y* and wedge wear, or wherever required to be adjusted.

A bent lever *v* is placed in front of the post A' having its fulcrum at 3 to the upper end of which lever the outer end of the shaft *c* is connected by means of a broad flat head or other means for moving the arm *u*² in or out of gear, the said shaft *c* having a horizontal sliding movement in the post A' for that purpose which will be more particularly shown in the operation.

The operation is as follows: The frame A, A, being adjusted by means of the braces F, G, and joints J J so as to bring the drill D over the place where the hole is to be drilled motion is given to the shaft L by the application of any convenient power either by the horse power and the connecting rods N N, and joints *n n*, or otherwise. If by means of the horse power P then the animals to propel it are to be attached to the sweeps *s s'*. The crank O on the shaft L raises and lowers the cross head by means of the connecting rod R attached to the crank and cross head. As the cross head rises with the drill gripped by the jaws W W it is caused to turn partly round horizontally by the winding ways or guides V V which changes the position of the drill D and when it has reached the point where it is required to let the drill fall and where the upward motion of the wedge is to be arrested, the wedge *a* strikes the loop *e* and there stops; while the cross head with the jaws wear iron and springs continuing to ascend, the wear irons slides upward from the straight parallel sides of the wedge till they reach the sloped sides of the wedge, when their upper ends approach each other by the action of the springs *m m*, while the lower ends of the jaws W W recede from

each other or open from the drill—the drill then drops and performs its office of cutting the rock. The crank O continuing to turn brings down the cross head in a winding direction and in descending brings the lower end of the wedge *a* in contact with the adjustable arm *u*³ by which the downward motion of the wedge is arrested the wedge is then made to receive a vertical movement by means of the cam *j* on the shaft L which raises the lever *i* and this raises the rod *h* and the latter the arm *g*, Fig. 4 in the end of the axle *c* causing it to turn and raise the arm *u*² with the wedge *a* as before stated, forcing it up between the wear irons Y Y attached to the jaws, whose ends containing the rollers *y y* are forced asunder, or from the drill while the lower ends of the jaws are closed toward it and made to grip the drill; and the upward motion of the wedge is thus continued until the parallel sides of the shank thereof are forced between the wear irons in which position it will remain until the wedge again strikes the loop *l* on the cap *t*.

The springs *m m* act in the following manner when the cross head is rising with the drill gripped between the jaws Y Y the upper or smaller end of the wedge *a* strikes against the loop *l* when its upward motion is arrested and the cross head continuing to rise the rollers *y y* in the wear irons move upward toward the small end of the wedge gradually approaching each other and at the same time receding the ends of the jaws which are below the pins on which they turn, from the drill, of course liberating the drill; which, from its gravity falls and performs the operation of cutting—the said springs causing the jaws to close by extending themselves as the rollers pass from the wide to the narrow end of the wedge. These springs are again contracted in the reverse movement of the aforesaid parts in opening the jaws by raising the wedge between the rollers, by means of the arm *u*², on the axle *c* arm *g*—rod *h*—lever *i* and cam *j* on the axle L of the fly wheel *w* as above described.

What I claim as my invention (jointly with the late WILLIAM AVERY) and which I desire to secure by Letters Patent is—

The before described construction of the jaws for gripping and raising the drill in combination with the drill and winding ways for turning it and the manner of closing the jaws by means of the aforesaid combination of the arm *u* axle *c* arm *g*—rod *h* lever *i* and cam *j*—or any other combination substantially the same for a similar purpose.

HIRAM H. SCOVILLE.

Witnesses:

MERILL COBURN,
WILLIAM JONES.