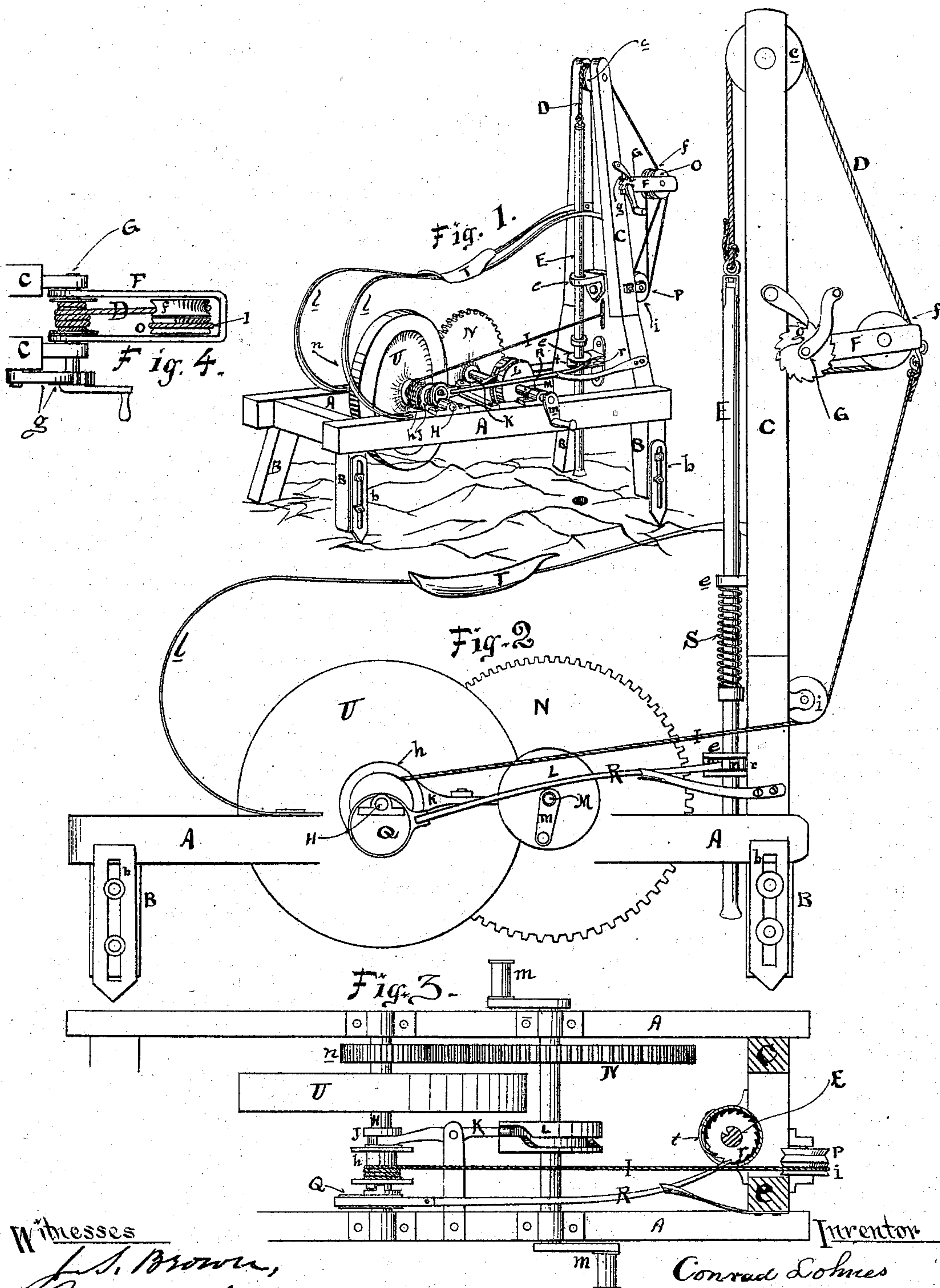


C. LOHNES.
Rock Drilling-Machines.

No. 137,010.

Patented March 18, 1873.



Witnesses
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UNITED STATES PATENT OFFICE.

CONRAD LOHNES, OF SPRINGFIELD, OHIO.

IMPROVEMENT IN ROCK-DRILLING MACHINES.

Specification forming part of Letters Patent No. 137,010, dated March 18, 1873.

To all whom it may concern:

Be it known that I, CONRAD LOHNES, of Springfield, in the county of Clark and State of Ohio, have invented a new and useful Improvement in Rock-Drilling Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing, in which—

Figure 1 is a perspective view of my machine. Fig. 2 is a side elevation; and Fig. 3 is a plan of the same. Fig. 4 is a plan, showing the drill, lever, and windlass.

My invention relates to that class of drilling-machines which are operated by manual power, in contradistinction to those machines which are operated by steam, compressed air, or other expansible gas, and may therefore be called engines. The object of my invention is to produce an automatic-power drilling-machine, capable of being operated and managed by one person, and propelled either by the feet or hands, as may be most convenient. It therefore consists, first, in the arrangement of a pulley to raise the drill, and an automatic let-off to release said pulley and permit the drill to fall; second, in the arrangement of the devices for the convenient propulsion of the machine by foot-power; third, in the arrangement of devices for automatically rotating the drill.

That others may fully understand my invention, I will particularly describe it.

A strong frame, A A, is provided to hold and support the working parts of the machine. The frame A is supported upon legs B, made adjustable as to length by slotted plates b, which may be moved up or down, as may be necessary, to level the frame A when standing upon an irregular surface. Upon the front end of the frame A I place an upright or derrick, C, and at the top thereof the sheave or pulley c, over which the drill-rope D passes. The drill E is suspended at the inner side of said derrick, and moves up and down loosely through guides e e. The vibrating frame F is pivoted upon the windlass-shaft G. A sheave or pulley, f, is mounted at the outer end of said frame, and the drill-rope D passes over said pulley f and is wound up on the windlass G. A ratchet and pawl, g, enables the windlass to be retained from unwinding, except when

it is required from time to time to lower the drill.

It is evident, now, if the outer end of the frame F be moved downward the rope D will be pulled over the pulley c, and the drill be raised; and if the said frame be then released the drill will fall of its own weight in the direction of its length, and the frame F will be drawn up. Successive depressions and releases of the frame F, as above described, will deliver a succession of blows by the cutting end of the drill.

The remaining devices of my machine are designed to effect automatically the successive depression and release of said frame F.

A shaft, H, is mounted in boxes upon the frame A, and upon said shaft a loose spool, h, upon which may be wound a rope, I, which passes thence forward under a pulley, i, mounted on the front or outer side of the derrick C, and then to the outer end of the frame F. A slipping clutch-ring, J, working on a feather, serves to couple or liberate the spool h; and, therefore, when coupled, and the shaft H is revolved, the rope I will be wound upon said spool, and the frame F will be depressed. A movement of the clutch-ring liberates the spool h, and permits the ropes D and I to relax and the drill to fall. A counter movement of the clutch-ring couples the spool h again and draws up the drill; so the successive coupling and release of the spool h effects the delivery of successive blows by the drill.

I render the successive coupling and release of the spool h automatic by means of a clutch-lever, K, and a groove-cam in wheel L, which is mounted upon the shaft M, also laid in boxes on the frame A.

I prefer to make shaft M the main driving-shaft, the motive power being applied to cranks m at the ends of said shafts. Shafts H and M are coupled by wheel N and pinion n.

When the drill is very heavy I use additional pulleys O P, the one at the end of the frame F, and the other by the side of pulley i, so that I have a compound pulley, as shown in Fig. 1, whereby a heavy drill may be operated, though with less speed.

It is known that the proper operation of a drill requires that the same shall be partially rotated after each stroke, so that the cutting-edge shall not strike twice in the same line.

This may be effected by the hands of an attendant, but it may advantageously be made automatic by the use of an eccentric, *Q*, placed upon the shaft *H*, and operating a reciprocating push-bar, *R*, which at each reciprocation partially rotates a ratchet-collar, *r*, through the center of which the drill *E* moves up and down. If the drill used is a bar of square steel then the hole through the collar *r* will be square; and if the drill be cylindrical then a spline may be employed, as shown in Fig. 3. The collar *r* is laid in a suitable box secured to the derrick *C*, and is provided with an auxiliary pawl, *t*, to prevent any retrograde motion of said collar. Instead of an eccentric, *Q*, any proper form of cam may be employed to move the push-bar *R*. The rope *D* should be attached to the upper end of the drill *E* by means of a swivel, which will permit said drill to rotate without twisting its rope.

If the drill *E* is so light that an effective blow cannot be delivered by reason of its gravity alone, the spring *S*, or an equivalent dead weight, may be employed to give the required force to the blow.

When this machine is propelled by one person, as is particularly designed, it will be preferable to operate it by foot-power, and I therefore arrange a seat, *T*, upon the elastic legs *t*, or their equivalents, upon which the operator can sit and propel the cranks *m* with his feet. His hands will then be at liberty to manage the drill. The balance-wheel *U* is placed upon the rapid shaft *H* to equalize the motion of the machine.

Having described my invention, what I claim as new is—

1. In combination with the frame and the derrick *A C*, and the drill *E* and ropes *D I*, the frame *F*, and the windlass *G* with its ratchet and pawl *g*, substantially as set forth.

2. In combination with the drill *E* and the rope *D* and the vibrating frame *F*, the rope *I*, spool *h*, and the clutch *J* upon shaft *H*, substantially as and for the purpose set forth.

3. In combination with the spool *h* and clutch *J*, and their connections to raise the drill, the clutch-lever *K* and cam-wheel *L*, as set forth.

4. A rock-drilling machine, constructed with the hinged derrick or drill-frame *C*, and the seat or saddle *T* mounted upon flexible supports *l* above the driving-wheel *N*, which is provided with foot-crank *m*, whereby the operator may propel the machinery with his feet, and have his hands at liberty to manage and guide the drill.

5. The drill-frame or derrick *C*, and the seat or saddle *T* upon elastic supports, arranged as set forth, in connection with the counter-shaft *H* provided with a cam or eccentric, *Q*, and the push-bar and ratchet *R r* to actuate the drill, as set forth.

6. A rock-drilling machine, with the following instrumentalities, arranged substantially as described—viz: A main frame, *A*, supported upon feet; a perpendicular derrick or drill-frame, *C*, erected upon and hinged to one end of said frame *A*; a seat or saddle, *T*, for the operator, mounted upon flexible supports and above the drive-wheel, which is fitted with cranks to be propelled by the feet; a cam, *Q*, upon the shaft of said drive-wheel; a push-bar actuated by said cam; and ropes or cords extending from shaft over pulleys *i f c* to the drill *E*, which is thereby suspended and operated in the manner set forth.

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Witnesses:

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