

No. 658,144.

Patented Sept. 18, 1900.

ALBERT FAUCK & ALBERT FAUCK, JR.

WELL BORING APPARATUS.

(Application filed Feb. 21, 1900.)

(No Model.)

Fig. 1.

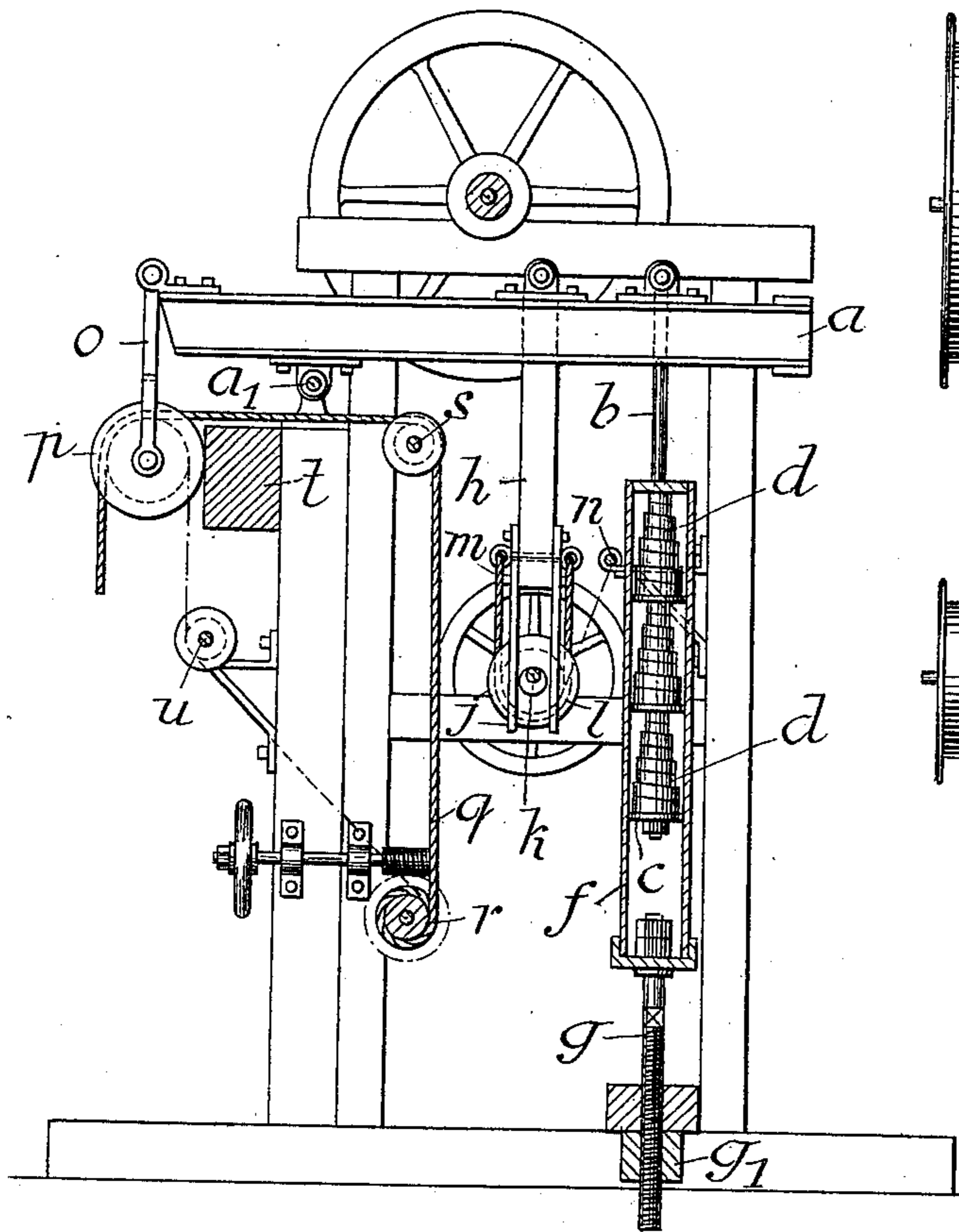
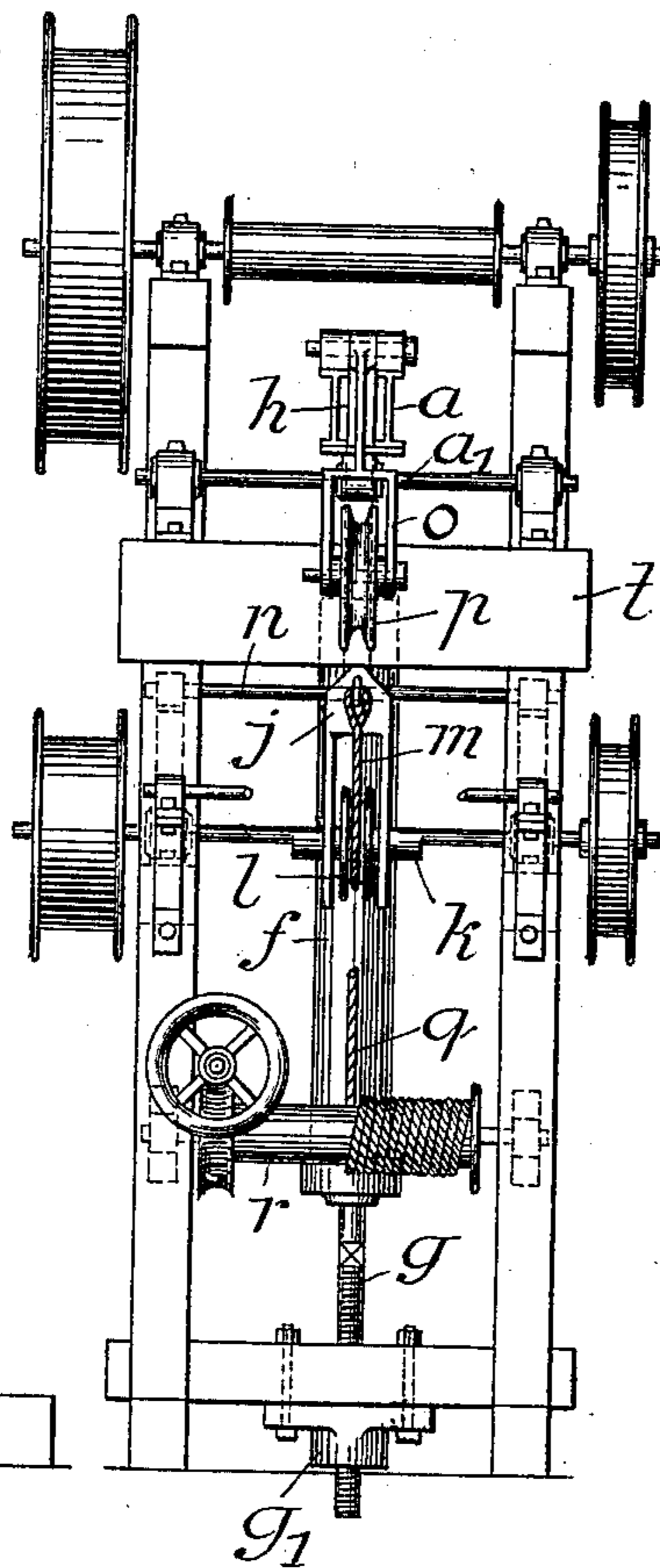


Fig. 2.



Witnesses.

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UNITED STATES PATENT OFFICE.

ALBERT FAUCK AND ALBERT FAUCK, JR., OF MAREINKOWICE, AUSTRIA-HUNGARY.

WELL-BORING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 658,144, dated September 18, 1900.

Application filed February 21, 1900. Serial No. 6,111. (No model.)

To all whom it may concern:

Be it known that we, ALBERT FAUCK and ALBERT FAUCK, Jr., citizens of the United States, residing at Mareinkowice, in the Province of Galicia and Empire of Austria-Hungary, have invented a new and useful Well-Boring Apparatus, of which the following is a specification.

Our invention relates to apparatus for boring wells by percussion and with the aid of a stream of flushing-water flowing downward through a tubular drill and ascending through the tubing of the well. As the said drill works within the flushing-water, which opposes to its movements a resistance proportionate to the square of the velocity of the drill, the loss of the work spent in raising the drill, and thereby giving it potential, will be the greater the higher the drill is raised for every blow. Consequently for the sake of well utilizing the power expended in boring with the drill the same must be operated with a rapid succession of blows of but little throw, as none of the known rigs are adapted to impart. For this reason our invention comprises a rig in which the walking-beam has its power-arm connected with a soft spring, balancing the weight of the drill-rods, and is operated by a connecting rod or link, the lower end of which carries a rope or chain loop passed round a pulley loosely mounted upon an eccentric driving-shaft. Possibility for varying the throw of the drill according to requirement is afforded by its suspension from a rope or chain running over suitably-chosen guide-pulleys and over a pulley suspended by means of a link from the load-arm of the walking-beam.

In order to make our invention fully understood, we shall hereinafter describe the same in detail with reference to the annexed two sheets of drawings, in which—

Figure 1 is a sectional side elevation of the improved rig required for operating the drill. Fig. 2 is a front elevation of the said rig.

Our improved rig, meeting the requirements before referred to, comprises a walking-beam *a*, adapted to oscillate around the axis *a'*. As the balancing of the weight of the drill-rods by a counterweight secured to the power-arm of the walking-beam, as usual

hitherto, would involve at each blow of the percussion-drill the reversal of the movement and the annihilation of the *vis viva* of heavy masses, we balance the said weight by a soft spring. It will be seen in the drawings that a rod *b* is jointed to the power-arm of the walking-beam *a* and that the free end of this rod carries a disk *c*, forming the abutment for a series of volute springs *d*. Against the topmost of these springs *d* bears the bottom of a cylindric case *f*, through the lower lid of which passes the top end of a screw-threaded rod *g*, the said screw-threaded rod *g* having a nut and check-nut screwed to its top end, which projects into the case *f*, while its bottom end is engaged in the screw-threaded hole of a block *g*, bolted to the derrick. By turning the screw *g* one may sufficiently put the springs *d* in tension as to enable them to accumulate the work performed by the weight of the rods while these latter descend. The link *h*, by means of which the walking-beam *a* is to be oscillated, has two fork-shaped checks *j* secured to its lower end, the said checks being placed on either side of the eccentric middle portion *k* of the driving-shaft, while the forks straddle a pulley *l*, loosely mounted upon the said eccentric portion *k* of the driving-shaft. The rope *m*, placed into the groove of the pulley *l*, forms at the bottom end of the operating-link *h* a kind of strap for the eccentric *k*, while the pulley *l* prevents sliding friction from being created. By hooking one end of the rope *m* to the rod *n*, secured to the derrick, instead of hooking it to the eye provided at the link *h* the throw of the walking-beam *a* is given the double length of the throw of the eccentric *k*.

To the load-arm of the walking-beam *a* a pulley or sheave *p* is mounted by means of a forked link or block *o*. The suspension-rope *q* of the drill comes from a windlass *r*, admitting of its being lowered out and shortened in, and runs over a guide-pulley *s* to the rising and lowering pulley or sheave *p*. In consequence of the tension of the rope *q* the sheave *p* is pressed against the vertical front face of a piece of timber *t*, fastened to the derrick, and as the drill is operated the sheave *p* rolls up and down along the said face of the timber *t*. The diameter of the sheave *p*

is so chosen that the suspension-rope *q* of the drill is kept in the axis of the well. By passing the rope *q* around another guide-pulley *u* instead of the guide-pulley *s*, and thereby
5 giving to both branches of the rope on both sides of the rising and lowering pulley *q* parallel positions, the throw of the drill is made twice as long as that of the sheave *q*.

What we claim, and desire to secure by Letters Patent of the United States, is—

1. The combination with a percussion-drill, intended to work within flushing-water, of a driving-shaft, carrying an eccentric, a pulley loosely mounted upon the eccentric, a
15 walking-beam, a connecting-rod jointed to the walking-beam and carrying a rope loop surrounding the said pulley, and a spring suspended from the power-arm of the walking-beam and adapted to be so put in tension
20 as to balance the weight of the drill-rods, substantially as and for the purpose described.

2. The combination with a percussion-drill, intended to work within flushing-water, of a driving-shaft, carrying an eccentric, a pulley loosely mounted upon the eccentric, a
25 walking-beam, a connecting-rod jointed to the walking-beam and carrying a rope loop surrounding the said pulley, a spring suspended from the power-arm of the walking-beam and adapted to be so put in tension as
30 to balance the weight of the drill-rods, and means, secured to the derrick, for fastening thereto one end of the rope forming the loop, substantially as and for the purpose described.

In witness whereof we have signed this
specification in presence of two witnesses. 35

ALBERT FAUCK.

ALBERT FAUCK, JUNIOR.

Witnesses:

VICTOR KERPL,

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