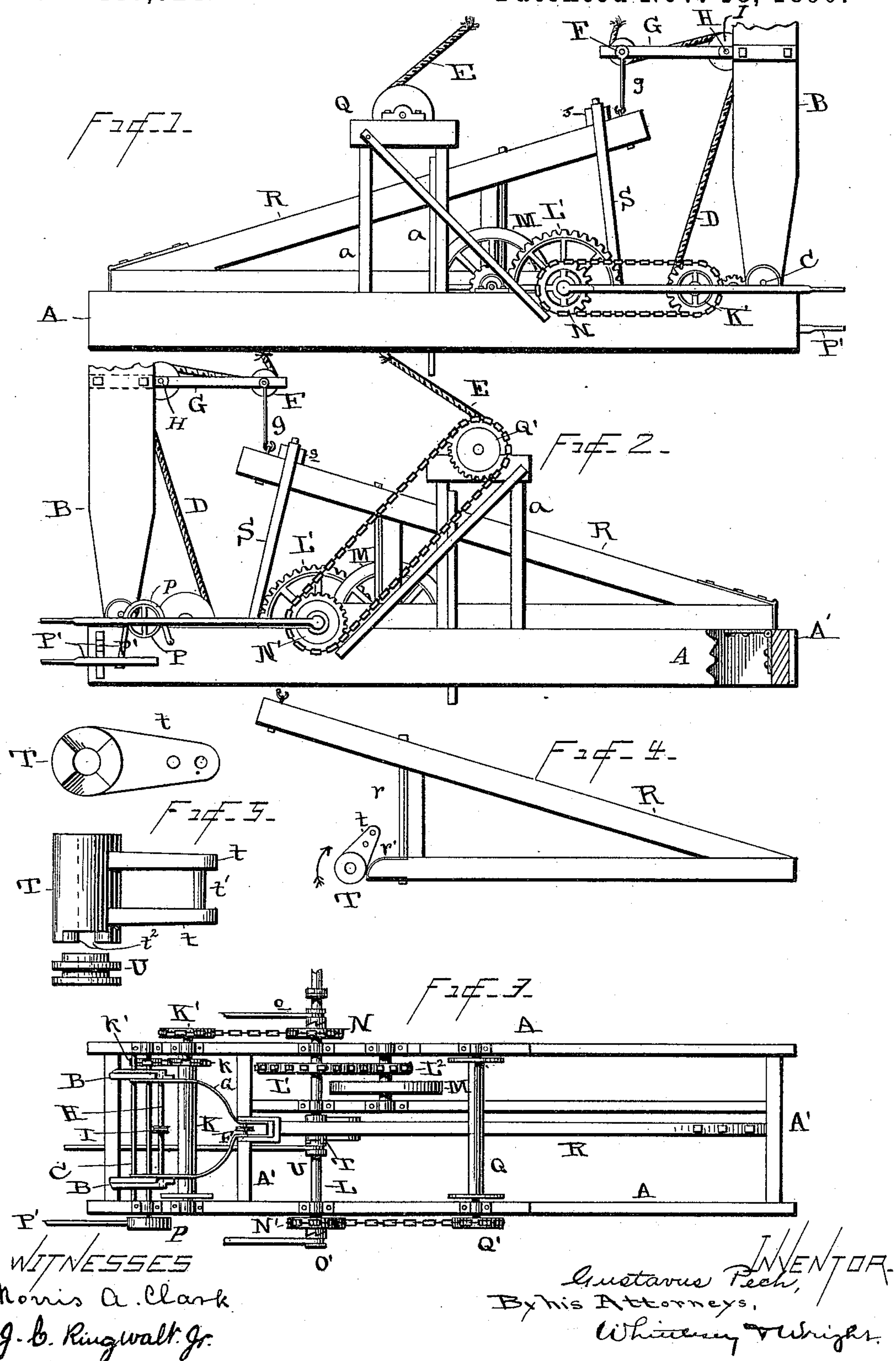


(No Model.)

G. PECH.
WELL DRILLING MACHINE.

No. 440,924.

Patented Nov. 18, 1890.



UNITED STATES PATENT OFFICE.

GUSTAVUS PECH, OF STORM LAKE, IOWA.

WELL-DRILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 440,924, dated November 18, 1890.

Application filed August 8, 1888. Serial No. 282,262. (No model.)

To all whom it may concern:

Be it known that I, GUSTAVUS PECH, a citizen of the United States, residing at Storm Lake, in the county of Buena Vista and State of Iowa, have invented certain new and useful Improvements in Well-Drilling Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to well-drilling machines; and its object is to increase the efficiency of the machine and give the operator greater control of it.

The invention consists of certain details of construction hereinafter set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figures 1 and 2 are views of the two sides of a machine embodying my improvements. Fig. 3 is a plan. Fig. 4 is a view of the walking-beam, and Fig. 5 shows the tripping dog or crank.

The same letters refer to corresponding parts in all the views.

The frame of the machine is composed of two sills A, united by cross-girts A'. At one end of the frame is a pair of upright booms B, pivoted on a horizontal shaft C, and constituting shears to support the drill, being steadied by guys in the usual manner. The upper ends of the booms are not shown in the drawings; but it is enough to say that they are united at the top and have fastened to them a double pulley-block, over which run the ropes D and E. These shears are a common feature in well-drilling machines, and need no further description.

The rope D is attached to the drill. (Not shown.) It runs from the drill up over one of the pulleys at the top of the shears, and thence down under a pulley F, journaled in the outer end of a swinging arm or lever G, which is hinged on a horizontal shaft H, suitably journaled in the projecting ends of the straps b, fastened to the shears B a few feet above the frame of the machine. On the shaft H is a pulley I, over which the rope D passes to a drum K, the shaft of which is

mounted in bearings on the sills A near the foot of the shears.

Power is supplied to the machine from a horse-power or other source, and is communicated to the transverse main shaft L, running in bearings on the sills A. A gear-wheel L' imparts motion through a pinion L² to a fly-wheel M, which gives steadiness to the movements of the various parts. Near each end of the shaft L is a sprocket-wheel N N', loosely mounted on the shaft and capable of being locked thereto by clutches O O'. The sprocket N communicates motion by means of a chain to a sprocket K' on the shaft of the drum K. Gear-wheels k k' communicate motion from said drum to a brake-wheel P, over which passes a friction-band p, attached to a lever P', by which the speed of the brake-wheel and drum can be governed. A notched plate p' holds the lever in any desired position. The sprocket N' communicates motion by means of a chain to a sprocket-wheel Q' on the shaft of a drum Q, suitably journaled on standards a. On this drum is wound the rope E, which runs over a pulley at the top of the shears, and is attached to the slush-bucket, by means of which the well is cleaned of the drill-cuttings.

Hinged at the end of the frame opposite to the shears B is a walking-beam R, which is capable of vertical oscillation. It is composed of a frame of timber, shaped like an A, laid on one side, as shown, and is strengthened by a tie-rod r. The lower leg of the A is shorter than the upper leg, and its end is preferably bound with iron r'. The upper leg plays between guides S, which are provided with a buffer s—such as a block of rubber—to receive and break the force of the upward strokes of the beam R. The walking-beam is connected with the lever G by a link g, so that the movements of the beam are imparted to the lever.

The weight of the drill is sufficient to keep the lever G and the beam R elevated as high as the buffer s will allow. In order to draw down the beam and the lever, and thereby lift the drill by taking up a fold in the rope D, the main shaft L is provided with a crank or trip T, loosely mounted on the shaft and composed of a hub having two parallel arms t, in each of which are two or more holes to re-

ceive the adjustable wrist-pin t' . On one end of the hub are formed lugs t^2 to engage with a clutch U on the shaft L. When the clutch is thrown into engagement with the crank, the latter will be coupled to the shaft and will revolve in the direction of the arrow in Fig. 4. At every revolution the wrist-pin t' will strike upon the iron-bound end of the beam R and carry it down, together with the lever G, thereby producing a downward pull on the rope D and lifting the drill. When the wrist-pin t' passes off the end of the lower leg of the beam R, the drill will be free to fall, and the beam R will rise until it strikes the buffer s. In this way the drill will be alternately lifted and dropped.

The main advantage of my construction is that the drill can be instantly stopped by throwing off the clutch U. This is a feature not possessed by any other similar machine with which I am familiar. Furthermore, the adjustable wrist-pin t' enables the length of stroke of the drill to be varied.

By releasing the lever P' and letting the rope D unwind the drill can be lowered, or by throwing the clutch O into operation the drill can be raised. In the same way the clutch O' enables the slush-bucket to be raised or lowered by means of the rope E. The levers that operate the clutches O, O', and U and control the friction-brake p all terminate at the front of the machine close to where the drill is at work, and where they are readily accessible to the operator in charge of the machine.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A well-drilling machine having a walking-beam, a main shaft, a crank loosely mounted on the shaft and provided with an adjustable wrist-pin, and a clutch sliding on the shaft and adapted to rigidly couple the crank to the shaft, substantially as described.

2. The combination, with the crank-shaft of a well-drilling machine, of a walking-beam composed of an A-shaped frame R, having the lower leg arranged to be acted upon by the crank and the upper leg adapted to impart movement to the drill, the beam being strengthened by a tie-rod r between the two legs and hinged to the frame of the machine near the meeting-point of the two legs, substantially as described.

3. The combination, with the crank-shaft of a well-drilling machine, of an A-shaped walking-beam R, hinged to the frame at its apex and adapted to be actuated by the crank-shaft, guides S between which the beam plays, and a buffer s to check the upward movement of the beam, substantially as described.

4. The combination, with the shears B, provided with a pulley at the top and with the shaft H near their base, of the horizontal lever G, hinged on the shaft H and carrying the pulley F, the pulley I on the shaft H, the rope D, passing around the pulleys I and F and over the pulley at the top of the shears, the walking-beam R, connected with the lever G, and means for actuating the walking-beam, substantially as described.

5. A well-drilling machine provided with a main power-shaft, a walking-beam, and a winding-drum for the drill-rope, the main shaft having loosely mounted thereon a crank for actuating the walking-beam, a wheel for communicating power to the winding-drum, a clutch sliding on the shaft and adapted to lock the crank rigidly to the shaft, and a second independently-operated clutch sliding on the shaft and adapted to lock the wheel rigidly to the shaft, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

GUSTAVUS PECH.

Witnesses:

LOYAL E. BALLAU,
FREEMAN A. BROWN.