No. 820,936. PATENTED MAY 15, 1906.

C. M. McAFEE.

WELL DRILLING MACHINE.

APPLICATION FILED FEB. 18, 1904.

2 SHEETS—SHEET 1.

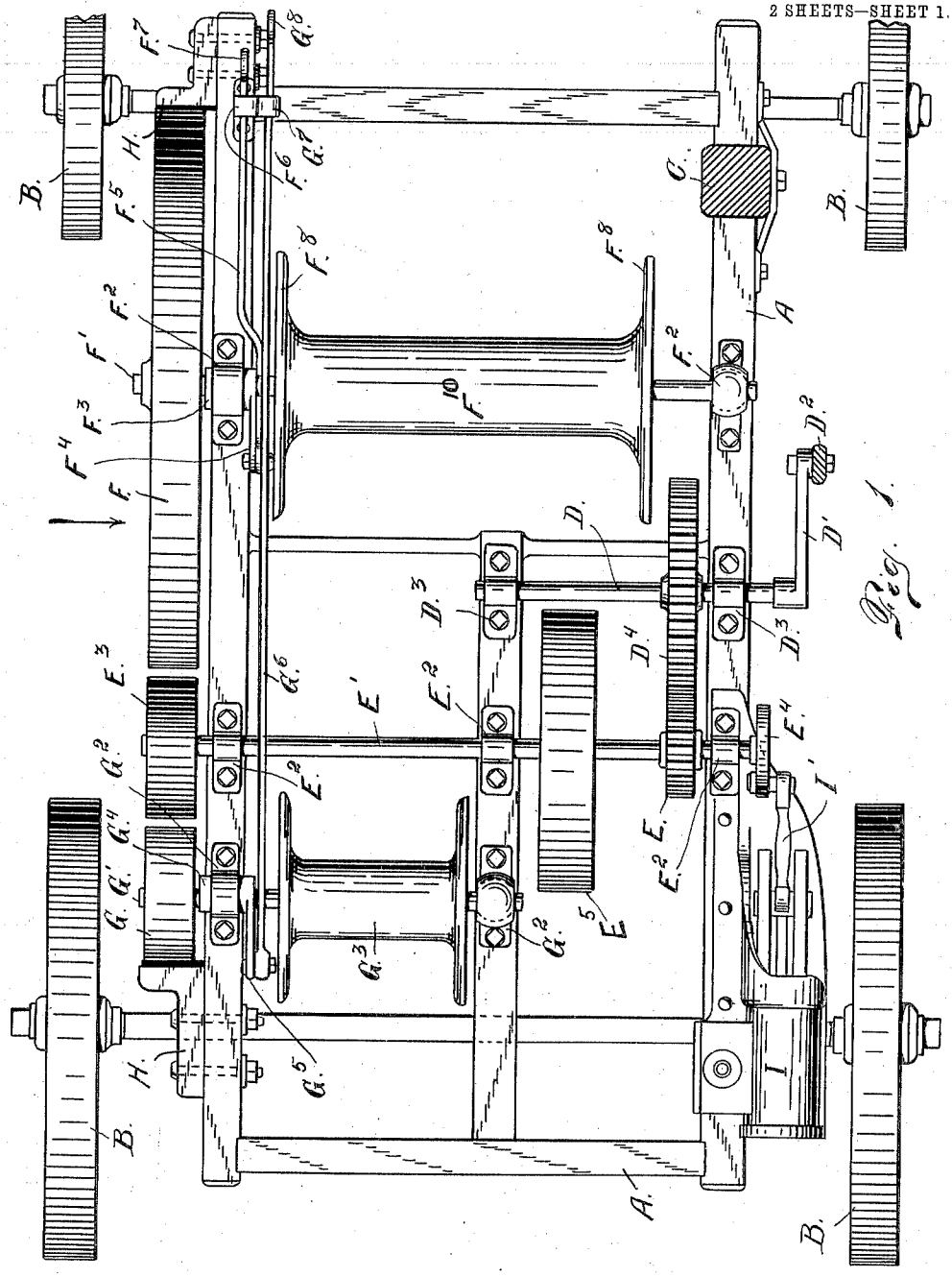

Fig. 1.

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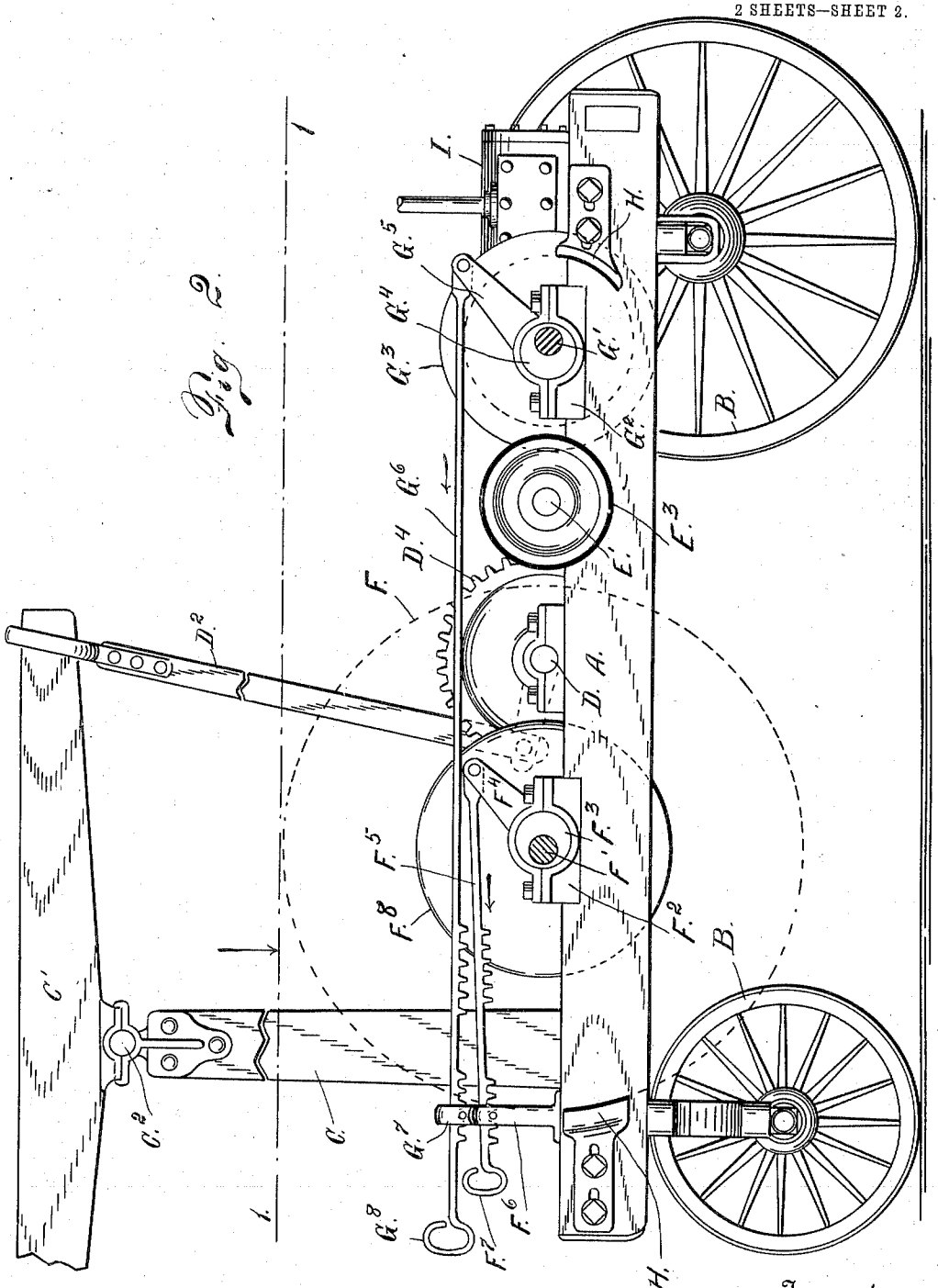
2 SHEETS—SHEET 2.

Fig. 2.



Witnesses

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CLAUDE M. McAFEE, OF WACO, TEXAS.

WELL-DRILLING MACHINE.

No. 820,936. Specification of Letters Patent. Patented May 15, 1906.

Application filed February 18, 1904. Serial No. 194,309.

To all whom it may concern:

Be it known that I, CLAUDE M. McAFEE, a citizen of the United States of America, residing at Waco, in the county of McLennan and State of Texas, 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 improvements in well-drilling machines, and has for its object to furnish a simple, compact, and effectively-operating drilling mechanism; and to these ends my invention consists in the various features of construction and arrangement of parts coöperating together substantially in the manner hereinafter set forth.

Having briefly outlined my improved construction, as well as the function it is intended to perform, I will proceed to describe the same in detail, reference being made to the accompanying drawings, in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is a top or plan view of my improved machine. In this view a portion of the mechanism is shown in section, taken on the line 1 1, Fig. 2. Fig. 2 is a side elevation viewed in the direction indicated by the arrow in Fig. 1, the bull-wheel shaft and the sand-reel shaft being shown in section and certain wheels removed in order to better disclose the other mechanism. The position of the wheels removed in this view is indicated by dotted lines.

The same reference characters indicate the same parts in all the views.

Let A designate a suitable relatively stationary frame mounted on ground-wheels B, as is usual in the portable well-drill machines. It will thus be understood, however, that my improvements are adapted equally well for standard or stationary well-drilling plants as well as for portable machines.

As shown in the drawings, what is known as the "samson-post" C is suitably mounted on the framework of the machine, and upon the top of this post is fulcrumed the walking-beam C′, the fulcrum being designated C^2. One end of this walking-beam is connected with the crank D′ of a crank-shaft D by a pitman D^2. The crank-shaft D is journaled in suitable boxes D^3, mounted on the framework of the machine. This crank-shaft D is also provided with a gear D^4, meshing with a pinion or smaller gear E, fast on the engine-shaft E′, the latter being journaled in boxes E^2. The gears E and D^4 are shown cogged in the drawings. This is such a common expedient that it is not believed necessary to illustrate both forms of gearing in the drawings. The engine-shaft E′ is also provided with a friction-wheel E^3, adapted to engage a wheel F, fast on a shaft F′, journaled in boxes F^2, fast on the frame. The friction-wheel is also arranged to engage a wheel G, fast on a shaft G′, journaled in boxes G^2. Fast on the shaft G′ is a reel G^3, usually termed the "sand-reel." The shaft F′ passes through an eccentric-bearing F^3, located in one of the journal-boxes F^2, whereby the position of the shaft may be changed to throw the wheel F into and out of engagement with the friction-gear E^3, according as it is desired to operate the bull-wheel or not. The shaft G′ passes through an eccentric-bearing G^4, engaging one of the journal-boxes G^2, whereby the shaft G′ may be adjusted to cause the wheel G to engage the friction-gear E^3 or not, as may be desired. The eccentric F^3 is provided with a crank-arm F^4, with the outer extremity of which is connected a pull-rod F^5, whose outer extremity engages a supporting-guide F^6. The outer extremity of this pull-rod is provided with a handhold F^7 for convenience of manipulation. The eccentric G^4 is also provided with a crank-arm G^5, with whose outer extremity is pivotally connected a pull-rod G^6, whose outer extremity is supported in a guide G^7. The rod G^6 also has a handhold G^8. The handholds of the two pull-rods are located in convenient proximity for operating purposes. Assuming that both wheels F and G are out of contact with the friction-gear E^3, it is evident that a pull on either rod G^6 or F^5 in the direction indicated by the arrows adjacent the said rods will actuate the shaft F′ or G′, as the case may be, sufficiently to throw the wheel F or the wheel G into contact with the friction-wheel E^3, thus causing the reel G^3 and the shaft F′ to rotate. It will also be understood that the opposite movement of either of the pull-rods will actuate the corresponding shaft to disengage the wheel F or G, as the case may be, from the friction-wheel. It will be understood from an inspection of the drawings that the friction-wheel E^3 is located in-

termediate the wheels F and G, thus being conveniently arranged, whereby either of the coöperating wheels may be readily thrown into engagement therewith, as circumstances may require. On the shaft F′ is mounted and made fast the bull-wheel F^{10}, having flanges F^8, forming a spool upon which the rope or cable employed in the well-drilling operation may be wound or from which it may be unwound, as may be desired.

From the foregoing description it will be understood that the bull-wheel or the sand-reel may be quickly and easily thrown into operative relation with the engine or operating-shaft E′ by simply turning an eccentric, as heretofore explained.

The frame of the machine is provided with brake-shoes H, adapted to engage the wheels F and G when the latter are thrown out of contact or out of engagement with the friction-gear E^3.

The engine for operating the machine is designated I, and a pitman I′ is connected with the crank E^4 of the engine-shaft E′.

From the foregoing description the use and operation of my improved machine will be readily understood. The crank-shaft D is operated from the shaft E′ by virtue of the engagement of the pinion E with the gear D^4, whereby a rocking movement is imparted to the walking-beam. When it is desired to operate the bull-wheel, its shaft F′ is shifted sufficiently to cause the wheel F to engage the friction-gear E^3, while when it is desired to operate the sand-reel G^3 its shaft G′ is actuated sufficiently to cause the wheel G to engage the friction-gear E^3. The convenience with which these adjustments may be effected will be readily understood from the foregoing explanation. Each pull-rod is provided with two sets of teeth adapted to engage pins in the supporting-guides, whereby the rods and their connections may be locked in either position of adjustment. Each of the shafts G′ and F′ is provided with a ball-and-socket bearing engaging the shaft-journal box remote from the journal-box in which the eccentric is located. The object of this ball-and-socket bearing is to permit the shaft to move laterally during the adjustment required to throw its wheel into or out of engagement with the friction-gears, as may be desired. As shown in the drawings, the engine-shaft E′ is provided with a fly-wheel E^5, which in the regular performance of its function gives an even steady motion to the shaft.

From the above it will observed that I arrange the engine on the right-hand rear side of the frame, where it is in the best position to counterbalance the action of the walking-beam and parts connected thereto, which enables the walking-beam to carry a heavy string of tools and drill to a great depth without displacing the frame in the operation. Furthermore, the engine-shaft is arranged in close juxtaposition to the other shafts, so that the latter are directly connected to the engine-shaft and so that the motion of the engine is imparted directly to each of these various shafts. By this relative location it is easy to transmit to each of the shafts the proper and desired speed, by means of which it can best accomplish the work intended for it to do. Thus it will be seen that the bull-wheel shaft, which requires the greatest power, is located at a greater distance from the engine-shaft, and the greater power can be transmitted directly to that shaft by means of the large friction-wheel on said shaft, while the sand-reel shaft is located adjacent the engine-shaft and a more rapid motion can be transmitted to it, as the work to be done by it is relatively smaller than that done by the bull-wheel shaft and requires less power and can be run at a higher speed. Again, the walking-beam shaft, which is operated a greater portion of the time, is located immediately adjacent the engine-shaft and is directly geared thereto. It will further be seen that the engine-shaft is provided with two gears, in the present instance one being a spur-gear and the other a friction-wheel, and all the gears of the three shafts—that is to say, the walking-beam shaft, the bull-wheel shaft, and sand-reel shaft—are in direct engaging relation with the engine-shaft gears without the intervention of any intermediate power-transmitting devices.

The operating parts are, so to speak, bunched together and in close relation to each other, so that not only can the power be directly transmitted to each operative part by the engine-shaft, but the weight of the parts is best distributed and in a manner as to enable the giving of a four-foot stroke to the walking-beam.

My apparatus is intended more particularly for heavy work and for use in drilling at great depths, and it is exceedingly important that the apparatus should not only be simple in construction, but that the parts should be arranged so that they can be maintained in their proper relation under great strains, and by mounting them upon the rigid frame in the manner set forth and connecting the various shafts directly to the engine-shaft I provide a most convenient, cheap, and effective arrangement for the purposes intended.

Having thus described my invention, what I claim is—

1. In a well-drilling machine, the combination with an engine-shaft, of a walking-beam shaft directly connected to the engine-shaft, a bull-wheel shaft directly connected to the engine-shaft, and a sand-reel shaft directly connected to the engine-shaft.

2. In a well-drilling machine, an engine-shaft having a spur-gear and a friction-wheel, a walking-beam shaft having a spur-gear en-

gaging the spur-gear on the engine-shaft, a bull-wheel shaft having a friction-wheel, a sand-reel shaft having a friction-wheel, and separate means for causing the bull-wheel and sand-reel friction-wheels to directly engage and disengage with the engine-shaft friction-wheel.

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

CLAUDE M. McAFEE.

Witnesses:
A. J. O'BRIEN,
DENA NELSON.