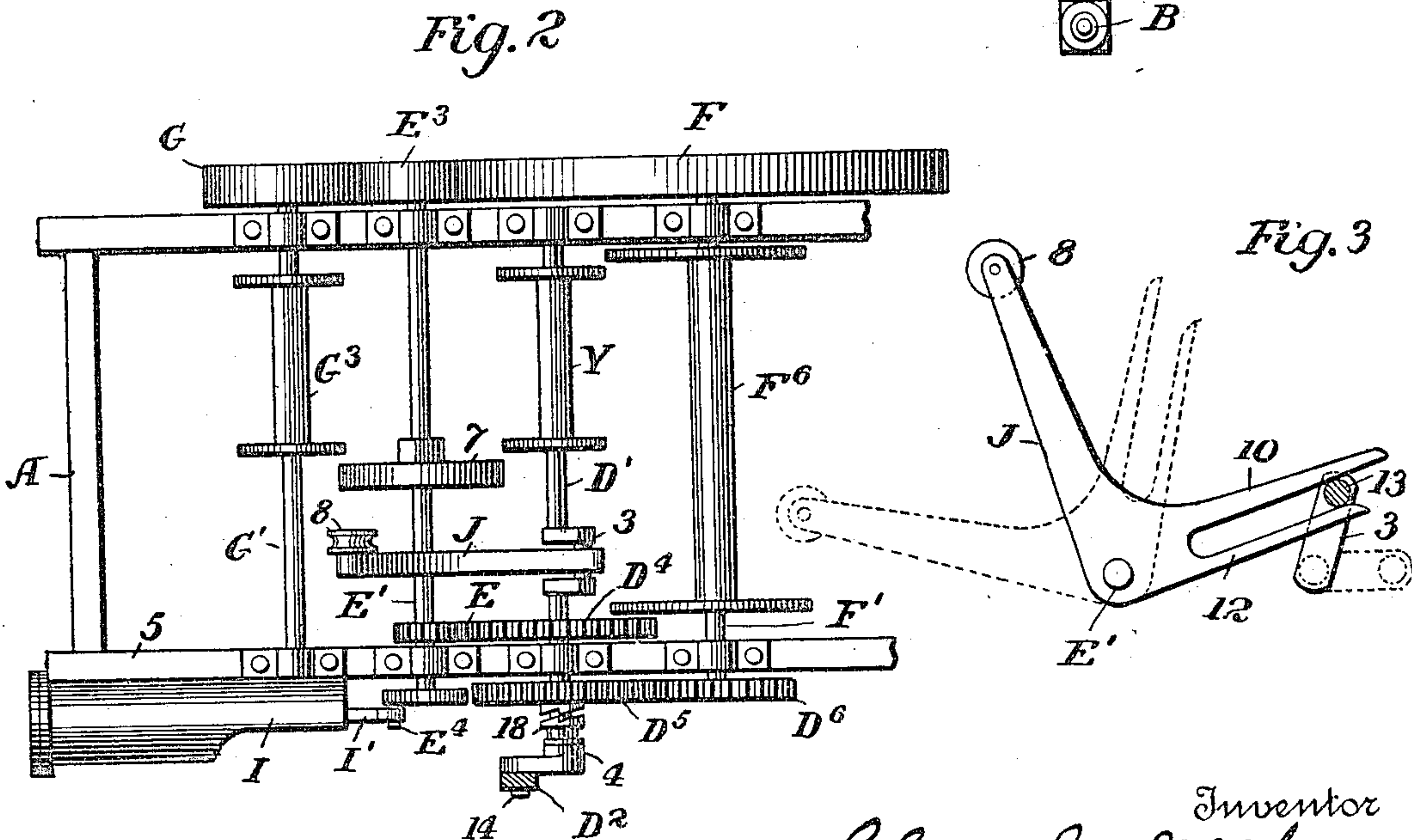
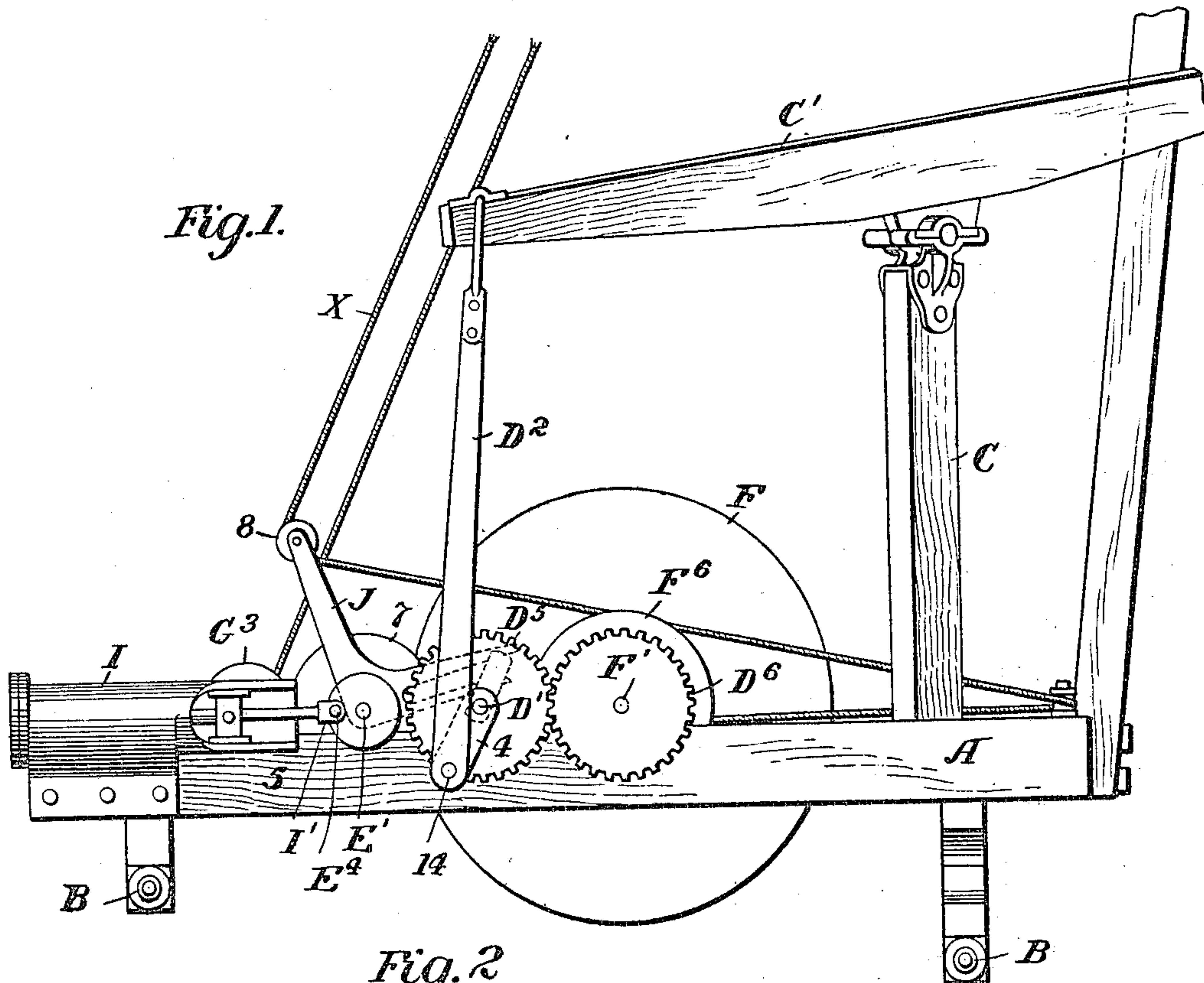


No, 831,675.

PATENTED SEPT. 25, 1906.

C. M. McAFEE.
WELL DRILLING MACHINE.
APPLICATION FILED APR. 30, 1906.



Witnesses

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CLAUDE M. McAFEE, OF CINCINNATI, OHIO.

WELL-DRILLING MACHINE.

No. 831,675.

Specification of Letters Patent.

Patented Sept. 25, 1906.

Application filed April 30, 1906. Serial No. 314,504.

To all whom it may concern:

Be it known that I, CLAUDE M. McAFEE, a citizen of the United States, residing at Cincinnati, county of Hamilton, State of Ohio, have invented certain new and useful Improvements in Well-Drilling Machines, of which the following is a specification.

My invention relates to well-drilling machines; and it consists in means whereby beam-drilling and spudding-drilling may be interchangeably effected, as fully set forth hereinafter, and as illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of sufficient of a well-drilling machine to illustrate my improvements. Fig. 2 is a plan view. Fig. 3 is a side view of the spudding-lever and its operating-crank.

The frame A of the apparatus is of any suitable construction and preferably adapted to be supported by wheels upon axles B B, and at one side of one of the stringers 5 of the frame is secured the suitable engine I, the connecting-rod of which engages the wrist-pin E⁴ of the engine-shaft E', having a suitable fly-wheel 7.

A pinion E upon the engine-shaft gears directly with a gear D⁴ upon a crank-shaft D', and gear D⁵ of the latter engages a gear D⁶ upon the bull-wheel shaft F', all of the said shafts turning in suitable bearings. Toothed gears are shown in the above-mentioned line of gearing; but it will be understood that any suitable friction-gears may be substituted therefor. In suitable bearings on the frame turns the sand-wheel shaft G', carrying the sand-reel G³, and at the ends of the various shafts G', E', and F' are friction-wheels G, E³, and F, the friction-wheel of the engine-shaft E' being brought into friction engagement with either the wheel G or the wheel F, according as it may be necessary to turn the sand-reel or the bull-wheel in a manner which will be well understood and which need not be further described.

The crank-shaft D' has two cranks 3 4, the latter adapted to operate a walking-beam C', which is pivotally connected with a samson-post C, through the medium of the pitman D². Upon the engine-shaft oscillates a spudding-lever J, so arranged that its lower arm may engage the crank 3, while the other arm projects upward and carries the sheave 8, around which passes the drilling-table X.

It is not necessary to describe the opera-

tions of the above parts, as they will be well understood by those skilled in the art, but the important features consist in the arrangements and construction of the spudding-lever, the engine-shaft, crank-shaft, and the pitman that operates the walking-beam.

It will be seen that the spudding-lever is so arranged that there are no parts extending below the frame, and that the guide-sheave 8 is carried up above the gearing in such a way as to be easily accessible, permitting the drill-rope to be readily placed on the same and removed, and that the spudding-lever and the walking-beam are directly operated from the same crank-shaft, and that by this arrangement the whole apparatus is rendered exceedingly compact with the parts accessible.

It is of course understood that the spudding-lever is at times thrown out of operation, and in order to permit this to be done readily and without the necessity of adjusting any part other than the lever itself I so divide or fork the lower arm of the spudding-lever as to form two fingers 10 12, so separated as to receive between them the crank-pin 13 of the crank 3, and the lower finger 12 is shortened, so that its outer end will be back of the crank-pin 13 when the crank 3 is in a horizontal position forward. In this position, therefore, the spudding-lever J may be tilted back to the position shown in dotted lines, Fig. 3, while in the position shown in full lines it will be properly engaged by the crank-pin and will be held in its engagement when the crank-pin 13 is forward by the stress upon the drill-rope. It will of course be understood that when the spudding-lever is in operation it is not desirable to operate the walking-beam, and the pitman D² is therefore connected to the crank 4 through the medium of a crank-pin 14, from which the end of the pitman may be readily detached.

In many instances it is desirable to drive the bull-reel shaft at a different speed from that secured by the gears F E³, and I therefore use the gearing D⁶ and D⁵, which latter, however, turns loosely on the shaft D', but may be connected thereto by a clutch 18, shifted by any suitable means, and although the said gears may be of any suitable character I prefer to use toothed gears, as they permit the shaft F' to be driven positively thereby in sleety weather, when friction-gears are sometimes liable to slip.

In well-drilling it frequently becomes necessary to put casings in the well, and to avoid the necessity of using the drilling-rope for this purpose I place on the crank-shaft a special spool Y, on which is coiled a suitable casing-line, and when the casing is to be lifted and lowered the tools are simply arrested in action, and the casing-line is connected to the casing-joint and is paid out and hauled in by the action of the engine. In addition, this casing-line can be employed for raising and lowering the pole-derrick and for other purposes, the engine being driven forward or reversed, as may be required in operating the line.

Without limiting myself to the precise constructions and arrangements shown, I claim—

1. In a well-drilling apparatus, the combination with a supporting-frame and engine connected thereto, of an engine-shaft, a crank-shaft geared directly with the engine-shaft, and a spudding-lever oscillating pivotally on said engine-shaft, a sheave carried by the upwardly-projecting arm of said lever, and the other arm engaging a crank of the crank-shaft.

2. In a well-drilling apparatus, the combination with a supporting-frame and engine connected thereto, of an engine-shaft, a crank-shaft geared directly with the engine-shaft, and a spudding-lever oscillating pivotally on said engine-shaft, a sheave carried by the upwardly-projecting arm of said lever, and the other arm engaging a crank of the

crank-shaft and forked, the lower finger of the fork being shorter than the upper.

3. In a well-drilling apparatus, the combination with a supporting-frame and engine connected thereto, of an engine-shaft, a crank-shaft geared directly with the engine-shaft, and a spudding-lever oscillating pivotally on said engine-shaft, a sheave carried by the upwardly-projecting arm of said lever, and the other arm engaging a crank of the crank-shaft and forked, the lower finger of the fork terminating at a point back of the wrist-pin of the crank when the latter is in the horizontal position farthest from the engine-shaft.

4. The combination in a well-drilling apparatus, of a frame, a driving-engine and shaft and post supported thereby, a shaft geared directly with the engine-shaft and having two cranks, a walking-beam and pitman connecting the same with one of the cranks, and a spudding-lever having a forked arm with fingers of different lengths engaging the other crank.

5. A well-drilling machine provided with a spudding-lever having a forked arm, one fork shorter than the other, and a crank-shaft having a crank engaged by said lever, for the purpose set forth.

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

CLAUDE M. McAFEE.

Witnesses:

THOMAS HOWE,
B. C. RUST.