2 Sheets—Sheet 1.

D. C. BRAWLEY & W. H. H. MORRIS.

Sand-Pump Reel for Deep Wells.

No. 200,687. **Patented Feb. 26, 1878.**

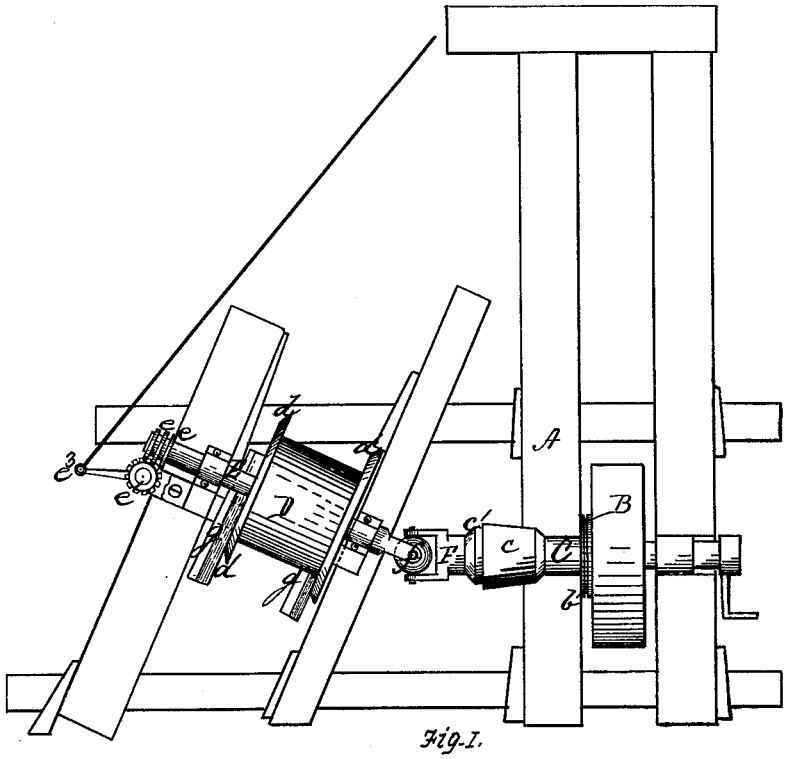

Fig. 1.

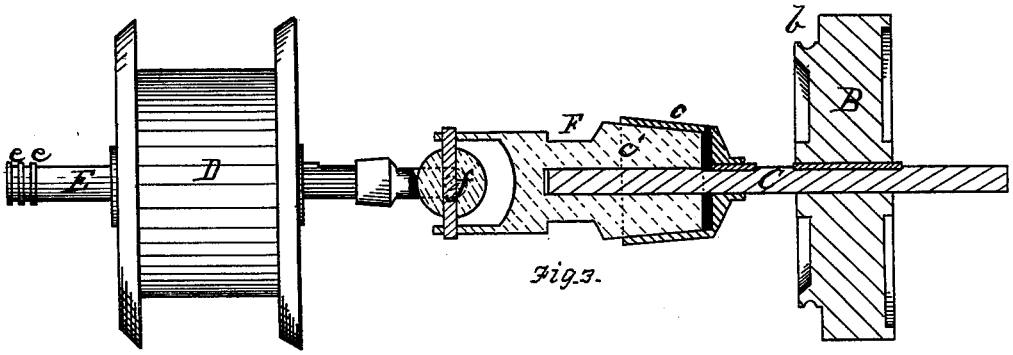

Fig. 2.

Witnesses.
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2 Sheets—Sheet 2.

D. C. BRAWLEY & W. H. H. MORRIS.

Sand-Pump Reel for Deep Wells.

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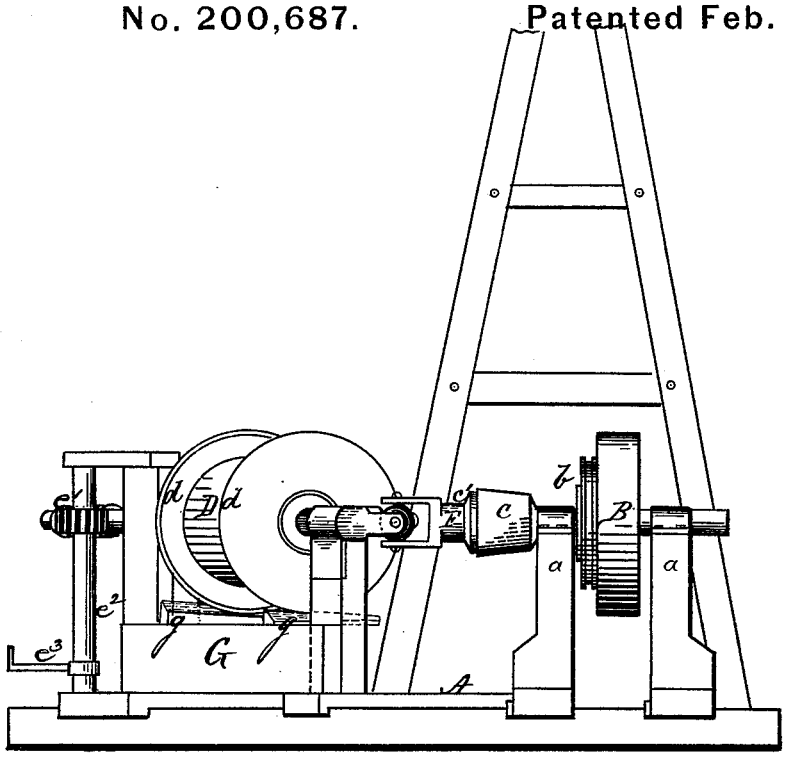

Fig. 2.

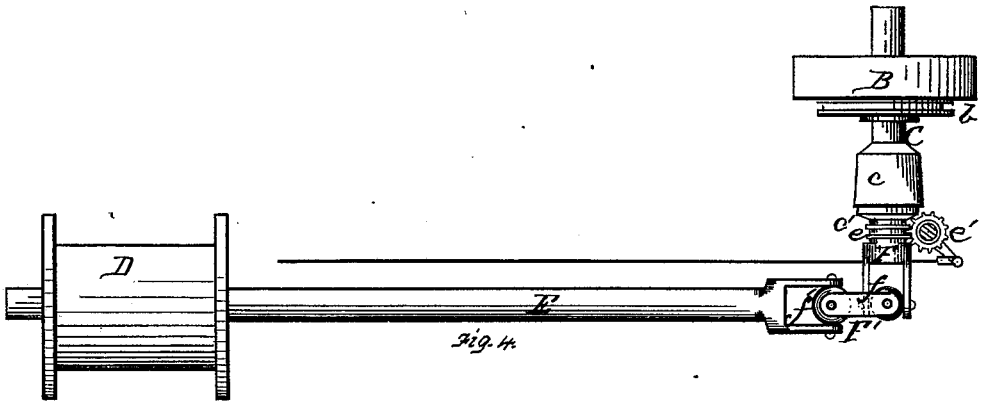

Fig. 4.

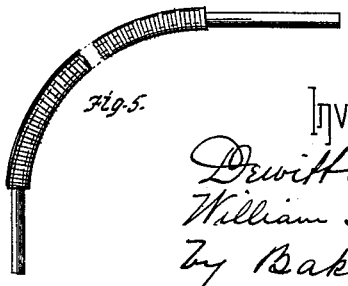

Fig. 5.

Witnesses.
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UNITED STATES PATENT OFFICE.

DEWITT C. BRAWLEY AND WILLIAM H. H. MORRIS, OF FRANKLIN, PA.

IMPROVEMENT IN SAND-PUMP REELS FOR DEEP WELLS.

Specification forming part of Letters Patent No. **200,687**, dated February 26, 1878; application filed January 19, 1878.

To all whom it may concern:

Be it known that we, DEWITT C. BRAWLEY and WILLIAM H. H. MORRIS, of Franklin, in the county of Venango and State of Pennsylvania, have jointly invented a new and useful Improvement in Sand-Pump Reels for Deep Wells; and we do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan view of devices embodying our invention. Fig. 2 is an elevation. Fig. 3 is a sectional detail view. Fig. 4 is a plan view, showing the devices differently arranged with relation to the well, and some slight modifications of construction incident to the position of the parts; and Fig. 5 is a diagram of a flexible power-connection which may be used.

Like letters refer to like parts wherever they occur.

Our invention relates to the means of operating sand-pump reels; and consists in combining with the sand-pump reel and its shaft a jointed or flexible driver and friction or like clutch mechanism, whereby the position of the sand-pump reel with relation to the derrick and well being bored may be changed and adjusted at will without regard to the position of the band-wheel or like source of power; and also in the construction of the shipping mechanism of the clutch, and to other features of construction, hereinafter more specifically set forth.

In the boring of oil, salt, and similar deep wells it is customary to erect a derrick with bull-wheel, band-wheel, and power for operating the drilling-tools, said derrick, power, &c., being subsequently retained for use with the pumping devices. At the time of drilling, what is termed a "sand-pump reel" or "reeling-drum" is also used for reeling the rope by which the "bailer" or sand-pump is raised and lowered. The latter is usually located off of the derrick, at an angle thereto, and is driven from the band-wheel by a bevel friction-wheel on the shaft of the reel. The difficulties attending the use of devices so constructed, the cost of repairing, lack of durability, and uncertainty of their action are too well known to the professional well-driller to need further recital herein.

The object of the present invention is to obtain a simple, durable, and effective construction of the power-connection between the sand-pump reel and source of power, and such as will permit of any desired adjustment or arrangement of the reel with relation to the derrick.

We will now proceed to describe our invention, so that others skilled in the art to which it appertains may apply the same.

A indicates the sills of a rig, and B a band-wheel, journaled in suitable housings or pillars *a* thereon. *b* represents the usual pulley for the tug for operating the bull-wheel, and C is the band-wheel shaft. *c* indicates the hollow cone or cup portion of a friction-clutch, either formed as a flange upon the band-wheel shaft C, or, preferably, keyed or otherwise adjustably connected thereto, so as to be removed when the sand-pump reel is no longer required. The end of the band-wheel shaft projects centrally through the cone-cup *c*, forming a pin or guide, upon which the cone c' of the clutch slides, thus steadying and centering the parts.

In suitable bearings, and usually on sills extending out from the rig, is the reeling-drum or sand-pump reel D, capable of end motion, and which is usually set up at an angle to the derrick, its shaft being at right angles to a line drawn from the well, so that the line of the sand-pump can be wound up readily.

E represents the shaft of the reeling-drum or sand-pump reel, provided at one end with a series of collars or rings, *e*, which mesh with a cog-wheel, e^1, secured to a vertical shaft, e^2, stepped in or on the sills, near the bearing of the reel.

Secured to shaft e^2 is a crank-arm or lever, e^3, by which the shaft and pinion can be rotated to give an endwise movement to shaft E and drum D. This shaft e^2 of the shipping-pinion may, if desired, be hung horizontally instead of stepped vertically. On the opposite end of shaft E is one-half of a universal joint, *f*, the other half of the joint being upon the end of a short shaft, F, terminating in a cone, c', which, with the cup *c* of the band-wheel shaft, forms a friction-clutch.

The flanges of the reel or drum D are beveled as at *d*, and upon a suitable cross-bar, G, below the drum, are secured beveled friction blocks or brakes *g*, which, when an endwise motion is given to the drum by the shipping devices to disengage the clutch *e e*^{1}, come in contact with the beveled flanges *d* and arrest the motion of the drum. This brake also serves a useful purpose in lowering the sand-pump and unreeling the line thereof.

The above construction is the cheapest, and will be found to answer every purpose where the angle of the power-shaft is not too acute; but where it is desired to set the reel at or near a right angle to the derrick, and near to or immediately at the well, the modifications shown in Fig. 4 can be made—viz., extend the shaft E of the sand-pump reel to the desired length, and interpose a second short shaft, F′, and universal joint *f′*. As, now, the end thrust of shaft E will not be in a line which will force the cone *c′* of the friction-clutch into the cup *c*, the shipping devices—that is, the rings *e* and shaft and pinion *e*^{1} *e*^{2}—should be transferred to the short shaft F; and, indeed, if desired, it may be thus used with the construction shown in Figs. 1 and 2.

In lieu of the universal joints *f f′*, a flexible shaft, such as shown in diagram, Fig. 5, or any of the well-known flexible shafts for communicating power, may be adopted and combined with the clutch and reel without departing from the spirit of our invention.

The operation of our devices is as follows: When the line of the sand-pump is to be wound upon the reel, an endwise motion is given to the shaft E (or F, as the case may be) and to drum D, to cause the engagement of clutch *e e*^{1}, whereupon power is communicated to the reel through the flexible or universal jointed connections, and the drum is revolved. By reversing the shipping mechanism *e e*^{1}, &c., a reverse endwise motion is given to the drum, the clutch mechanism is disengaged, and, the flanges of the reel D coming in contact with the brakes *g g*, the motion of the reel is arrested. When the sand-pump is to be lowered, the frictional contact between the flanges *d d* and the brakes *g g* can be regulated by the shipping mechanism *e e*^{1} *e*^{2}, &c., so as to permit the gradual and steady unwinding of the line and descent of the sand-pump.

The advantages of our invention are, that the sand-pump reel may be located at any desired point, and at the same time operated from the main power; that the devices can be readily removed, when not required, and that they are durable and efficient.

We are aware that flexible power-shafting has heretofore been employed for driving machinery arranged at various angles to the main driver or source of power, and do not claim such subject-matter. Neither do we claim a clutch mechanism *per se;* but,

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

1. The combination, with the sand-pump reel and its shaft, of the flexible driving-shaft and clutch mechanism, for communicating power to the reel, substantially as specified.

2. The combination, with the sand-pump reel or drum and clutch mechanism, of the collared shaft and pinion and shaft shipping mechanism, substantially as specified.

3. The combination, with the sand-pump reel or drum, provided with a collared shaft, of the pinion and shaft, for giving an endwise motion to the drum, and the brake-bars, for arresting the motion of the drum, substantially as specified.

In testimony whereof we, the said DEWITT C. BRAWLEY and WILLIAM H. H. MORRIS, have hereunto set our hands.

DEWITT C. BRAWLEY.
WILLIAM H. H. MORRIS.

Witnesses:
JAMES I. KAY,
JOHN K. SMITH.