D. C. BRAWLEY.

SAND-PUMP REEL.

No. 192,561. Patented July 3, 1877.

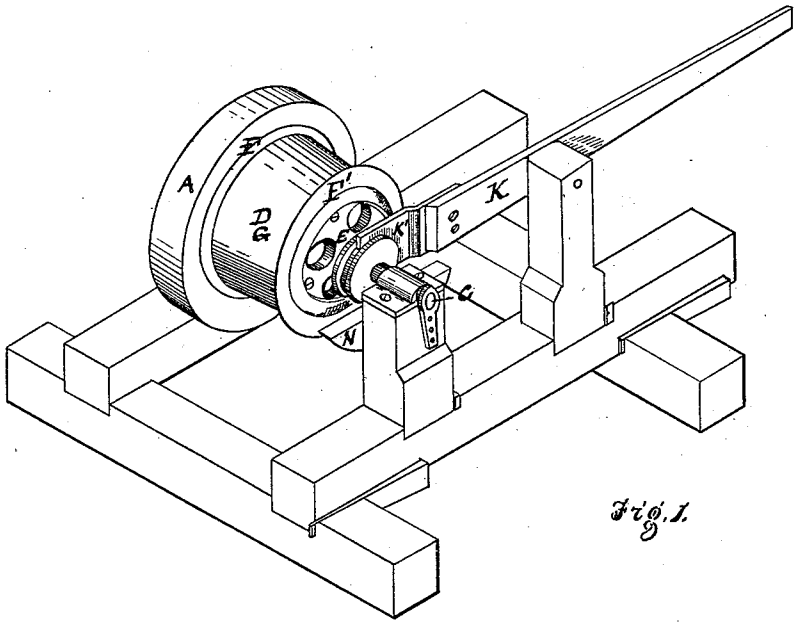


Fig. 1.

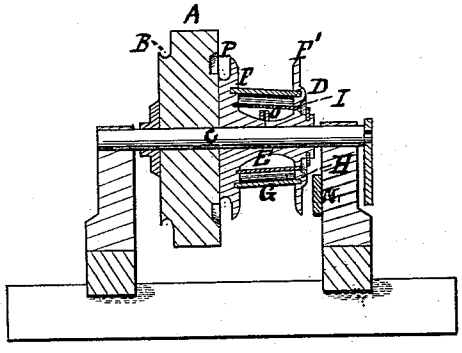


Fig. 2.

Witnesses.

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DEWITT C. BRAWLEY, OF PETROLIA, PENNSYLVANIA.

IMPROVEMENT IN SAND-PUMP REELS.

Specification forming part of Letters Patent No. **192,561**, dated July 3, 1877; application filed June 7, 1877.

To all whom it may concern:

Be it known that I, DEWITT C. BRAWLEY, of Petrolia, in the county of Butler and State of Pennsylvania, have invented a new and useful Improvement in Sand-Pump Reels; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing, forming a part of this specification, in which—

Figure 1 is a perspective view of my improved sand-pump reel, and Fig. 2 is a vertical section of the same.

Like letters of reference indicate like parts in each.

Heretofore, sand-pump reels for oil, salt, and other wells of great depth having a small caliber, have been made with a long shaft and a beveled friction-wheel, which, when the sand-pump was desired to be raised, was brought to a frictional contact or bearing with the periphery of the band-wheel of the well-rig by a lever, and so held during its operation. The band-wheel being made of boards nailed side by side to the proper thickness, and having a wooden edge, rim, or periphery, in time became worn by the frictional contact of the reel-pulley, and the pressure at the point of contact being great because of the small surface of the bearing, the band and friction wheels soon become worn, and thereby an uncertain operation and great injury to the band and friction wheels were produced. This necessitated a frequent substitution of new parts, and was most injurious to the well in stopping the operation when working in the oil-sand and permitting the water to stand therein, as well as a great loss of time and money.

Another form in use consisted in an additional pulley or bearing-wheel upon the band-wheel shaft, upon which the reel-pulley bears so as to relieve the band-wheel of its wearing action. In this case the reel-shaft was also different, in that it was provided with flanges and arms extending between them, arranged concentrically around the shaft, so as to afford a winding or line-reeling surface of larger diameter than the shaft itself. These devices are open to many objections. They are very expensive; the power, being communicated by the frictional contact of the two wheels at their peripheries, must be very great, and the bearing of the wheels upon each other very severe; the wear of the surfaces of contact is also very great and consequently very injurious to the wheels; the motion is rendered uncertain by the wear; the amount of machinery is very great, and the parts are constantly requiring to be renewed.

My invention enables me to do away with the wear, reduce the cost of construction, number of parts, amount of power necessary to operate the reel and the labor involved in its use, the room occupied by the machinery, and to gain greatly by reducing the cost of operating it.

It consists, first, in the formation of a reeling-drum upon the shaft of the band-wheel, the same being loosely mounted thereon and having an operating end motion, so as to be brought into frictional contact with the side of the band-wheel, in order to cause the reeling of the line thereon to raise the pump; and, second, in the construction of the various parts.

By reference to the drawing, the band-wheel will be seen at A. It is supplied with a tug-pulley, B. This has heretofore been applied to the friction-pulley of the reel-shaft, or used separately, and as the cord by which it was operated drew in a different direction from that of the band on the band-wheel, the effect was to strain the boxes as well as the keys to all of the wheels, so that it was very difficult to make the keys stand the strain, which, by my invention, is avoided. I form this tug-wheel upon, and as part of, the band-wheel, so that the belts draw against each other, and thereby avoid the difficulty above mentioned, and secure great steadiness in the operation of the machine, and at the same time I do not destroy its utility as a device for operating the bull-wheel.

On the shaft C of the band-wheel I mount a reeling-drum, D, which is composed of a hub, E, flanges F F′, and reeling-surface G, arranged concentrically around the hub E. The segments forming the reeling-surface G are secured by placing their ends in grooves H on the inner faces of the flanges F F′, the lower flange being secured to the other by screw-bolts I. The groove in the lower flange, F′, is of smaller diameter than the other, so

that the winding-surface G is tapering or coniform, as shown. This tapering form is given for the purpose of causing the line to wind truly. The drum D is mounted loosely upon shaft C, and is susceptible of a sliding motion lengthwise thereon. This motion is given by the operator at pleasure, by means of the lever K, which is bifurcated at K′, the fingers fitting in opposite sides of the groove L on the hub E. On the inner side of the post or bearing M is a friction-brake, N, which is designed to control the drum D, as hereinafter described. At the other end the sliding movement of the drum brings it into contact with the side of the band-wheel.

The operation of the reel is as follows: The line runs from the sheave-pulley at the top of the derrick to the drum D, which is commonly about two feet long, and has a diameter of about four feet. When it is desired to raise the sand-pump the drum moved by the lever K is brought into working contact with the band-wheel A, and, being held against it, is thereby caused to turn and reel up the line. When it is desired to stop reeling, the drum is moved away from the wheel by means of the lever, and is prevented from unreeling, in case the weight of the sand-pump is on the rope, by bringing it against the friction-brake N. The drum being loose on the shaft C, the latter is not impeded by the stopping of its motion. The taper of the drum is only required to be very slight. The segments forming the reeling-surface may be secured by bolting them to an inwardly-projecting collar made on the flanges F F′, or by a band or hoop driven over them. The lower flange F′ should be cast open, with arms or spokes, for the twofold purpose of making it lighter and cheaper, and permitting access to the oiling-cup O. The other flange F is made solid to prevent the drippings falling from the line on the reel from passing along to the band-wheel. In furtherance of this purpose I also provide a groove, P, on the outer side of the flange F, to collect the drippings from the rim of the flange or the housing of the band-wheel, and pass them off. The drum D, as a reeling device, is a great improvement over the old winding-shaft. A great objection to the latter was that the folding of the rope over so small a diameter was very wearing and injurious thereto, and caused great friction, besides rendering it necessary to turn it at a high rate of speed. The diameter of my drum is, for ordinary purposes, about four feet, and its length about two feet, while in the old forms the diameter was from eight to twelve inches, and the length from six to eight feet. Thus my drum occupies very much less space, while the diameter, being great, enables me to compensate for the decreased length, operate it at less surface-speed, and prevent the injury to the line consequent to the frequent folding on a winding-surface of small diameter. The method shown of obtaining power to rotate the drum does away entirely with the wear between band-wheel and drum, there being no rubbing or rolling contact between them, for when the drum is thrown against the wheel it forms part of and turns with it. This contact, however, is not rigid, so that, in case a stone or other obstruction should stop the pump, the tension of the line would overcome the power of the frictional contact, and cause the drum to slip on the shaft, and so not break the line. The drum or reel can be stopped instantly by reversing the lever and throwing it against the brake. The dimensions of the drum can be varied at pleasure, and the flanges or other parts may be made of any desired material.

It is obvious that the form and connection of the lever K may be varied greatly, and still preserve its indentity. If desired, the hub of the drum may be made in two parts, as that would cheapen its construction. The hubs in each case would of course support the flanges. It would then be necessary to have an oil-cup for each hub.

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

1. In a sand-pump reel, a reeling-drum, mounted loosely on the shaft of a band, belt, or tug wheel, and rotated by being brought and held in friction-contact with the side of the wheel, substantially as and for the purpose described.

2. In a sand-pump reel, the combination of band, belt, or tug-wheel, a drum mounted loosely on the shaft of the same, and having an end movement thereon, and a lever for giving the drum an end movement on the shaft, substantially as and for the purposes described.

3. A reeling-drum composed of a hollow hub, end flanges, and a reeling-surface placed between the flanges and concentric with the hub, substantially as and for the purpose described.

4. The combination of the lever-operated sliding drum and a friction-brake, substantially as and for the purposes set forth.

In testimony whereof I, the said DEWITT C. BRAWLEY, of Petrolia, Butler county, and State of Pennsylvania, have hereunto set my hand.

DEWITT C. BRAWLEY.

Witnesses:
JAMES I. KAY,
T. B. KERR.