B. F. MULL.

Windlass and Derrick for Boring Artesian and other Wells.

No. 220,408. Patented Oct. 7, 1879.

FIG. 2

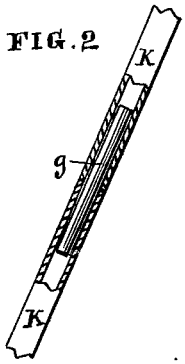
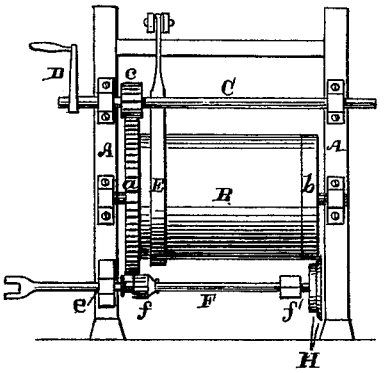


FIG. 1

FIG. 3



Witnesses

Frank A. Brooks

Geo. H. Strong.

Inventor

Benjamin F. Mull

By Dewey & Co Attys

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

BENJAMIN F. MULL, OF MERCED, CALIFORNIA.

IMPROVEMENT IN WINDLASS AND DERRICK FOR BORING ARTESIAN AND OTHER WELLS.

Specification forming part of Letters Patent No. **220,408**, dated October 7, 1879; application filed June 25, 1879.

To all whom it may concern:

Be it known that I, BENJAMIN F. MULL, of the town and county of Merced, and State of California, have invented a Windlass and Derrick for Artesian-Well Boring; and I hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to an improved windlass and derrick for artesian-well boring; and my improvements consist, first, in a novel construction of the windlass so that it may be worked by hand or horse or steam power, and by which it may be worked either by cog or friction gearing for more or less speed, as desired; second, in forming the derrick of light sections of boiler-iron connected together in a peculiar manner, by which means I am enabled to form a light high derrick, which may be easily separated in sections, so as to be transported from place to place without difficulty, as is more fully described in the accompanying drawings, in which—

Figure 1 is a perspective view of my invention. Fig. 2 shows the method of coupling the jointed derrick. Fig. 3 is an elevation of the windlass and gearing.

For ordinary artesian-well boring purposes a windlass is always necessary in order to lower down or lift out the boring-rods and to lift into position the sections of casing which are lowered into the well. It is often desirable to apply more power to this windlass than can be given by hand, and again it is desirable to vary the speed of such windlass to suit the purposes for which it is intended.

In order to accomplish these objects I have devised the peculiarly-constructed windlass herein described.

Let A represent the windlass-frame, which may be suitably braced and strengthened, and which is usually fastened to the ground, so as not to be moved when lifting any weight greater than itself. On this frame I mount the barrel or drum B in the usual way, said barrel being provided with the spur-wheel *a* at one end, and the band *b* at the other, as shown. Above it is the shaft C, provided with a pinion, *c*, and cranks, D, for working the barrel by hand, the pinion engaging with the spur-wheel *a* on said barrel. A crank may be placed on each end of the said hand-shaft. A strap-brake, E, worked by a lever is provided to control the movement of the barrel as the rope unwinds.

At the lower part of the frame is placed the shaft F, which is provided with a universal joint at its outer end, so as to connect with the tumbling-rod of a horse-power. The journal for this shaft is made on the upright frame-work, as shown at *e*, and the shaft extends across said frame-work, as shown. The outer end is journaled, as shown at *f'*, in the end of a foot-lever, G, and outside the journal, on the end of a shaft, is a friction pulley or roller, H, as shown. By depressing the outer end of the lever G this friction-pulley is brought in contact with the band *b* on the drum, and the drum caused to revolve by the rotation of the shaft on which said pulley is fixed. I construct this friction-roller in a peculiar manner. On the end of the shaft is a common casting, onto which I bolt or otherwise secure a steel or wrought-iron pulley, H, of greater diameter than the casting which impinges on the band. This is preferable to having a cast-iron pulley. The steel or wrought-iron disk may be removed from the casting and trued up at any time, but will last in its proper shape much longer than an ordinary casting. At the opposite end of this shaft F, inside the frame, is a sliding pinion, *f*, which is thrown in or out of gear by means of the shifting-bar I.

When it is desired to run the windlass or drum by means of horse-power, the pinion *f* is thrown into gear with the spur-wheel *a*, and at such times the friction-pulley will not touch the drum. When, however, it is desired to run at a high speed, when there would be danger of breaking the spur or pinion, said pinion is thrown out of place, and by stepping on the lever G the friction pulley or roller H is raised and impinges on the band *b* on the drum, thus rotating the drum rapidly and without danger of any breakage.

The derrick I form of two parts, as shown, these two parts being suitably braced by ropes or cords. The uprights are formed of sections K, made of boiler-iron, so as to be stiff and strong, and at the same time light. At the alternate ends of each section is formed a plug, *g*, half of which fits inside of each pipe, the plug being riveted or otherwise secured to the

inner end of one of the sections, and fitting into the open end of the next. By constructing the spars or uprights in this manner, of hollow sections of boiler-iron fitted together, as described, I am enabled to maintain a very high derrick, which may at the same time be easily taken apart and transported from place to place. At the upper end are wooden sections K′ and a cross bar, L, carrying a sheave or pulley, M′, over which the rope from the drum leads.

On one end of the derrick-uprights is secured a small hand-windlass, M, which is used for lifting light weights, handling the lever, and for forcing the sections down, or doing any work when the main windlass is in use. In order to prevent the upright from turning around when this windlass is in use, I attach to the upright a bifurcated arm, O, secured to said upright by a pin, and by driving two pins, *l*, into the ground beside this arm the mast is prevented from turning in case a side strain is brought on the windlass.

By making the derrick in the light sections, as shown, I am enabled to form a very high one, which will be at the same time light, removable, and easily separated, so as to be portable. It is important to have the derrick high, since long sections of rods may be used, and there is no danger of hoisting them into the sheaves. The longer the rod-sections the less time is lost in coupling and uncoupling them; but with the portable derrick in common use it is impracticable to have them very high, as the spars are usually made in one piece.

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

1. The windlass or drum B, provided with the crank-shaft C and pinion *c*, in combination with the power-shaft F, with its clutch *f* and friction-pulley H, whereby the arm may be rotated by hand or power at greater or less speed, as desired, substantially as herein described.

2. In combination with the rope-carrying drum B, with its spur-wheel *a* and band *b*, the shaft F, with its sliding clutch or pinion *f*, arranged to be thrown in or out of gear by the shifting-bar I, and also carrying the steel or wrought-iron friction-roller H, fitted to be thrown in contact with the band *b* by means of the lever G, on which said shaft is journaled, by which the drum may be rotated by means of the gear or friction pulley as desired, substantially as herein described.

3. The derrick-mast, composed of a series of tubular iron sections, K, each section provided with a projecting plug, *g*, whereby said sections are adapted to be connected together by inserting the plug of one section into the open end of the next section, substantially as herein shown and described.

4. In combination with a derrick-mast having a windlass, M, attached to it, the bifurcated arm O, adapted to be secured in a horizontal position by means of the pins *l*, whereby said derrick-mast is prevented from turning, substantially as herein described.

In witness whereof I have hereunto set my hand.

BENJAMIN F. MULL.

Witnesses:
CHAS. G. YALE,
S. H. NOURSE.