(No Model.) 2 Sheets—Sheet 1.

J. G. MARTIN.

WELL DRILLING RIG.

No. 295,413. Patented Mar. 18, 1884.

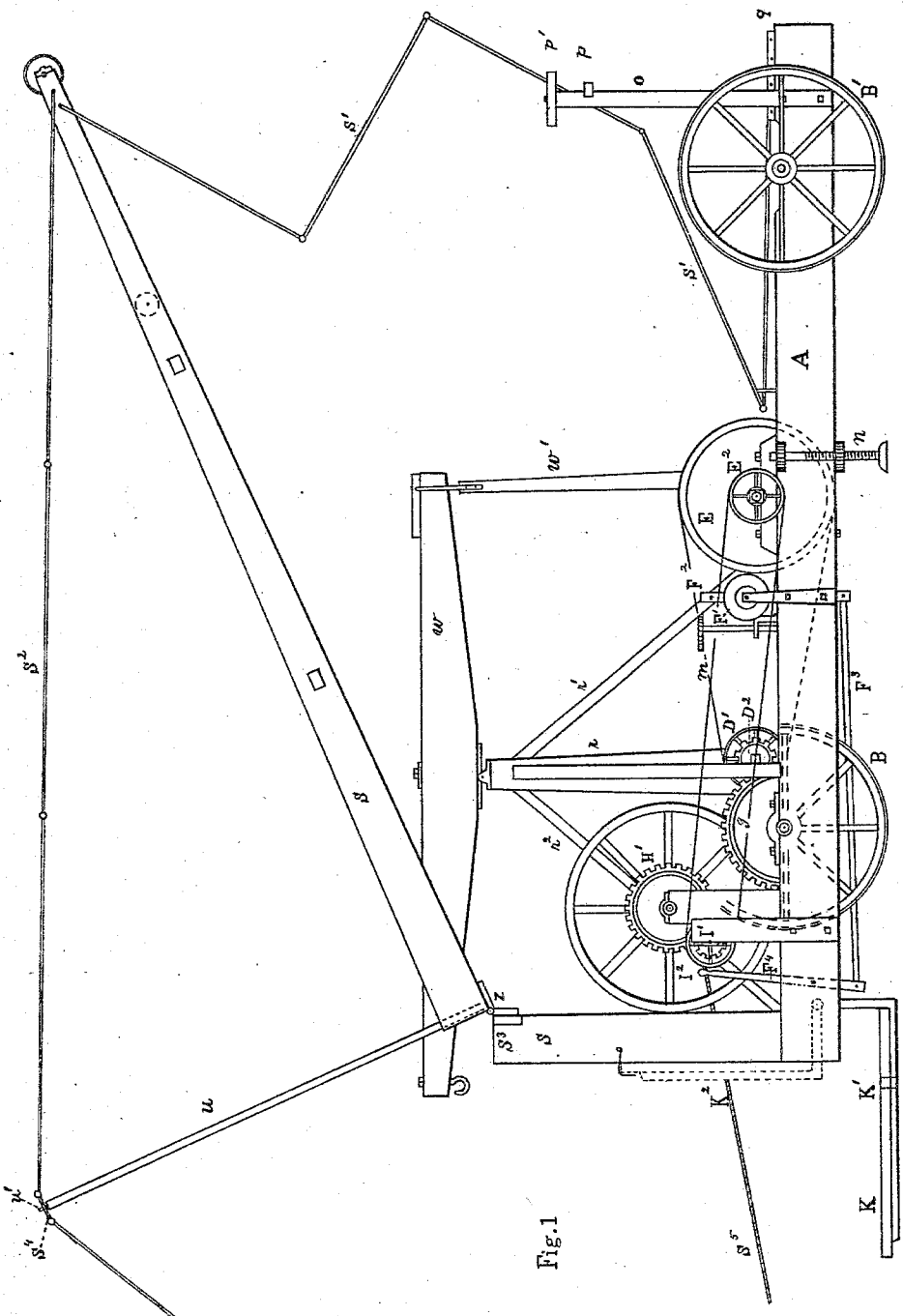


Fig. 1

Witnesses.
J. S. Thompson
D. L. Lewis

Inventor.
James G. Martin

N. PETERS. Photo Lithographer, Washington, D. C.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 3

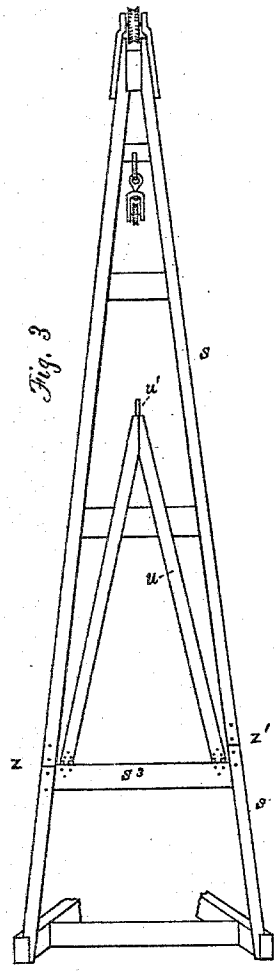
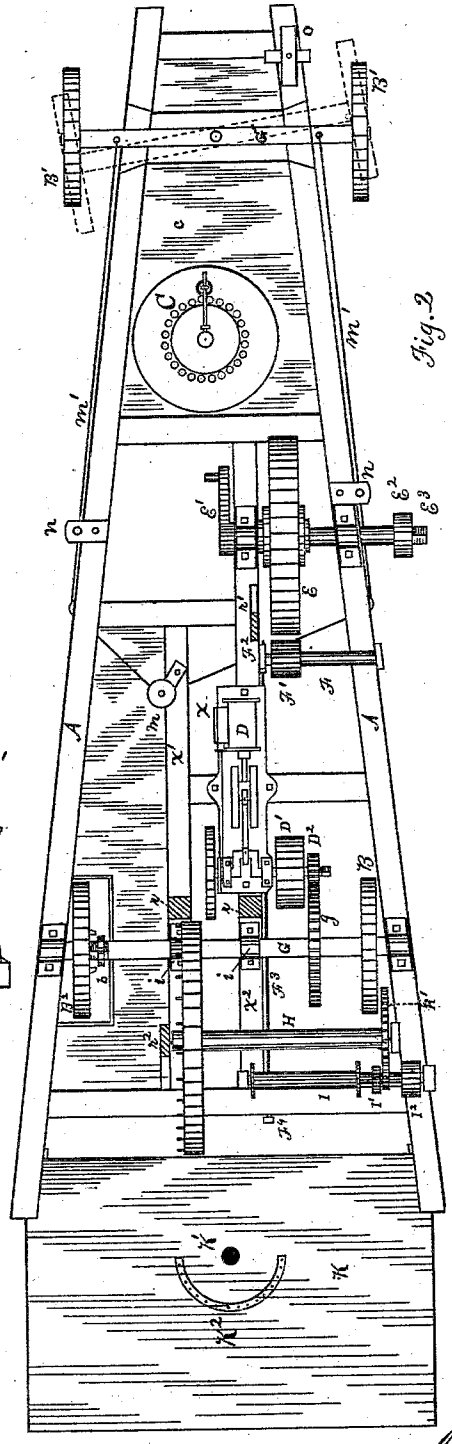


Fig. 2



Witnesses.
D. L. Lewis
J. S. Thompson

Inventor.
James G. Martin

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

JAMES GILLOTT MARTIN, OF BRADFORD, PENNSYLVANIA.

WELL-DRILLING RIG.

SPECIFICATION forming part of Letters Patent No. 295,413, dated March 18, 1884.

Application filed July 9, 1883. (No model.)

To all whom it may concern:

Be it known that I, JAMES G. MARTIN, of Bradford, McKean county, Pennsylvania, have invented new and useful Improvements in Well-Drilling Rigs; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and the letters or figures of reference marked thereon.

The object of my invention is to provide a cheap and convenient portable rig for drilling oil and other Artesian wells. In many parts of the country it has become necessary, in order to obtain a lasting supply of wholesome water, to sink wells into the strata of rock underlying the soil and gravel beds, and when such wells have been finished the machinery and rig are no longer needed there; hence has arisen the necessity for a portable drilling-rig, which may be used to sink numerous wells by moving it from place to place. To avoid the expense of horse-power for transportation, I have arranged means for converting the apparatus into a traction-engine, by which the machinery may be moved in smooth or moderately-hilly country. Care has been taken to provide for folding and packing the various parts into a compact form, as will more fully appear by reference to the accompanying drawings, in which—

Figure 1 is a side elevation of the device, showing the derrick partially raised, with the boiler omitted and only the driving-wheel and a spur-wheel on the engine-shaft shown. Fig. 2 is a plan view with derrick, samson-post, and working-beam omitted, so as not to obscure the view of parts below them. Fig. 3 is a rear elevation of the derrick and hoisting-boom.

A A is a strong wooden frame mounted on the axles G and G′, having the wheels B, B′ B′, and B^2.

C, Fig. 2, represents a boiler, preferably an upright.

D is the engine; D′, the driving or belt pulley; and D^2 is a spur-wheel upon the engine-shaft, engaging with wheel *g* upon the axle G. It is laterally movable upon the engine-shaft, so as to be easily disengaged from wheel *g*. E is the band-wheel, whose shaft bears the crank E′ and belt-pulley E^2.

F is the sand-reel shaft, on which is coiled the sand-pump line. It has a friction-wheel, F′.

F^2 is a swinging post, pivoted at its upper end to a brace of the samson-post. (See Fig. 1.) In this post one end of the sand-reel shaft is journaled.

F^3 is a bar connecting the lower end of post F^2 with the lever F^4, within easy reach of the driller, by means of which the friction-wheel F′ is brought into contact with the periphery of the band-wheel E, for the purpose of raising and lowering the sand-pump from the well.

H, Fig. 2, is the bull-wheel shaft, around which is coiled the cable that lowers the drilling-tools into and withdraws them from the well. It bears the spur-wheel H′, with which the wheel I′ on shaft I engages. Wheel I′ is arranged to be thrown into and out of gear, as is more fully explained hereinafter. The shaft I is used for a spudding-shaft for operating the tools before sufficient depth has been attained to allow of the attachment of the beam to the tools. It is also used for hoisting the derrick and for pipe-driving.

K is a floor on which the driller stands while at work. It is hinged to the frame A in such manner that when it is let down for use it falls on a level with the ground, and when folded for transportation it occupies the position shown in dotted lines at K^2 in Fig. 1.

K′ is a hole in the derrick-floor, through which the well is drilled.

M is the steering-wheel, around the shaft of which passes a rope or chain, *m′ m′*, Fig. 2, passing over pulleys in the frame A, and attached on each side to the axle of the forward truck. This axle is swiveled upon the truck, and by turning the wheel *m* in either direction the axle and wheels may be moved to the right or left, as the case may be.

n n are screw-supports located near the center of the frame. When the rig is located for drilling, these screws are designed to be turned down until they have a firm bearing upon the ground, to prevent the timbers of the frame from springing.

o is a support for the upper portion of the derrick when it is folded for transportation. It has a cross-bar, *p*, upon which the top of derrick rests, and another, *p′*, to turn on a pivot at right angles thereto, to hold the derrick in place.

r is the samson-post, and *r′*, r^2, and r^3 are the braces thereto.

The derrick *s s* is jointed at *z z′*, the lower

part being securely attached to the rear end of the frame A. In making this joint, one of the stationary posts—that one on the same side as the support *o*—is cut a little longer than the other, as shown at *z'*, Fig. 3, so that when the top of the derrick is lowered it will fall to one side of the center of the frame, thus being out of the way of the smoke-pipe of the boiler. Near the upper end of the derrick are attached the guys s' and s^2. They are jointed at convenient distances, so as to fold together for transportation. The forward guy, s', is attached to a bracket, *q*, Fig. 1, on the forward part of the frame, in which are holes at convenient distances for adjusting the length of the guy.

u is a hoisting-boom, with which to raise the folding part of the derrick into an upright position. It is hinged to the cross-beam s^3 of the derrick, (see dotted lines, Fig. 2,) so as to swing in a plane nearly parallel with that of the derrick. At the upper end of the boom is a pin, *u'*, engaging with a link or loop, s^4, in guy s^2.

The pulley D' on the engine-shaft is connected by a belt with the band-wheel E, and pulley E^2 on the band-wheel shaft is similarly connected with pulley I^2 on the spudding-shaft I. The space, *c*, forward of the boiler and between the timbers of the bed-frame is used for storing fuel. The space, *x*, between the sills x' and x^2 is occupied by a water-tank for supplying the boiler.

E^3 in Fig. 2 shows the squared end of the band-wheel shaft, where an attachment of horse-power may be made when deemed expedient.

Wheel B is fixed upon the axle G; but wheel B^2 is arranged with a clutch, *b*, so as to be used as a traction-wheel or allow it to turn upon the axle to facilitate turning corners. During transportation the cable and sand-pump line are left on their respective shafts, and the drilling-tools are stored at convenient places about the carriage. The bed-frame is made widest at one end, and the supporting-wheels are at that end placed inside the bed-rails, so as to give sufficient width for the foundation of the derrick and for the location of the shafts, and at the same time leave the wheels sufficiently close together to travel upon ordinary wagon-roads.

To economize space, timber, and labor, I place the bull-wheel or tug-wheel between the derrick and samson-post, and journal one end of the bull-wheel shaft in one of the samson-post braces, as shown at r^2, Fig. 2. I also locate the engine between the samson-post and band-wheel, and am thus enabled to place the sand-pump-reel shaft on the side of the band-wheel nearest the derrick, for it is necessary to locate the sand-reel where its friction-wheel may be brought into contact with the band-wheel at that portion of the periphery not covered by the belt. By this arrangement of parts I am enabled to utilize another samson-post brace, r', to serve as a support for the sand-reel post F^2, Fig. 1.

The ordinary working-beam and pitman are used, and the samson-post differs from that in common use only in this: It is made of two upright posts located at *r r*, Fig. 2, joined together at the top by a cross-beam. These posts are braced on each side by braces running to the sills x' and x^2.

To prepare this rig for transportation, the derrick is folded toward the front, the top resting upon the support *o* and secured by the cross-bar *p'*. The guy-wires s' and s^2 are folded on the front part of the carriage. The hoisting-boom *u* is folded forward, resting upon the samson-post. The floor K is turned up against the rear of the bed-frame and secured in that position. The screws *n n* are removed or turned up on a level with the bed-frame. The pitman *w'* is removed from the crank-pin, or the belt is removed from the driving-pulley D'. Then, by throwing wheel D^2 on the engine-shaft into gear with wheel *g* on the rear axle, G, the carriage is converted into a traction road-wagon.

To prepare for drilling, the wheels B and B^2 are partially sunk in the ground or securely blocked, the screws *n n* are turned down till a portion of the weight of the carriage and load rests upon them, the floor K is lowered into a level position, and wheel D^2 is disengaged from wheel *g*. The derrick is raised and secured in an upright position, which is done as follows: The boom *u* is raised to about a right angle with the swinging part of the derrick. The guy s^2 is hooked over the pin *u'* on the end of the boom, and passed some distance to the rear. A rope is here attached to it, and, after passing around a pulley, is passed back around the spudding-shaft I, as shown at s^5, Fig. 1. The engine is then used to revolve shaft I, and the derrick is raised, when the guy s^2 is securely fastened in the rear of the carriage, and guy s' is adjusted and fastened at bracket *q*, Fig. 1. Shaft I is similarly used to raise the ram when driving pipe preparatory to drilling, and also to raise and drop the tools during the process of spudding. When shaft I is used for such purposes, wheel I' is disengaged from wheel H'. Shaft H and its wheels are used when the cable has been attached to the tools for raising them from and lowering them into the well. When so used, wheel I' is thrown into gear with H', and it will be observed that shaft I is driven by a system of belts and wheels by engine D.

The shaft or axle G is made extra heavy, and where it crosses the sills x' and x^2 it is turned off to a smooth bearing. The sills have heavy journal-boxes at this point, and the axle passes through them, serving as a support to the sills which bear the weight of the samson-post, working-beam, and drilling-tools.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a well-drilling rig, the combination of

a bed-frame, A, mounted on wheels, and adapted by means, substantially as shown, to be converted into a traction-wagon, and a derrick adapted to fold down into a convenient position for transportation, substantially as shown.

2. In a well-drilling rig, the combination of a bed-frame, A, mounted on wheels and adapted to be moved by an engine mounted thereon, a band-wheel, E, having crank E′, pitman *w′*, working-beam *w*, and derrick *s s*.

3. In a well-drilling rig, the combination of the bed-frame thereof and the screws *n n*, or either of them, for the purposes mentioned.

4. In a portable drilling-rig, a bed-frame widest at one end, with the wheels of one truck located inside the bed-rails, substantially as shown and described.

5. In a well-drilling rig, the floor K, adapted to let down into proper position for use and to fold up for transportation, substantially as shown and described.

6. In a well-drilling rig, the combination of a base or frame, A, a derrick joined to said base and having a break-joint above the base, and guys for holding the upper section of the base in position, and adapted to be folded upon each other, substantially as described, when the upper section of the derrick is folded upon the base, substantially as described.

7. In a well-drilling rig, the combination of a base and a vertical derrick formed in two parts, hinged together, the hinge on one side of the derrick being lower than on the other side, for the purpose set forth.

8. In a well-drilling rig, the combination of the derrick *s s*, swinging boom *u*, and guy s^2, substantially as shown.

9. In a well-drilling rig, the combination of a frame or base, A, having support *o* at one side of its front end, and a folding derrick having the hinge on one side lower than on the other, substantially as described, so that when folded the upper end will rest upon the support *o*, for the purpose set forth.

10. In a device for drilling in front of the rig, a frame having a derrick at its front end, a samson-post back of the derrick, and the bull-wheel between the samson-post and the derrick, substantially as described.

11. In a well-drilling rig, the combination of a spudding-shaft and the bull-wheel shaft by means of gear, substantially as described, and for the purpose set forth.

12. In a well-drilling rig, the combination of the band-wheel E, spudding-shaft I, and bull-wheel H.

13. In a well-drilling rig, the combination of the axle G′, tiller-chains *m′ m′*, and shaft of wheel *m*, substantially as described and shown.

In testimony that I claim the foregoing I have hereunto set my hand.

JAMES GILLOTT MARTIN.

Witnesses:
JAMES W. SHAW,
A. P. HUEY.