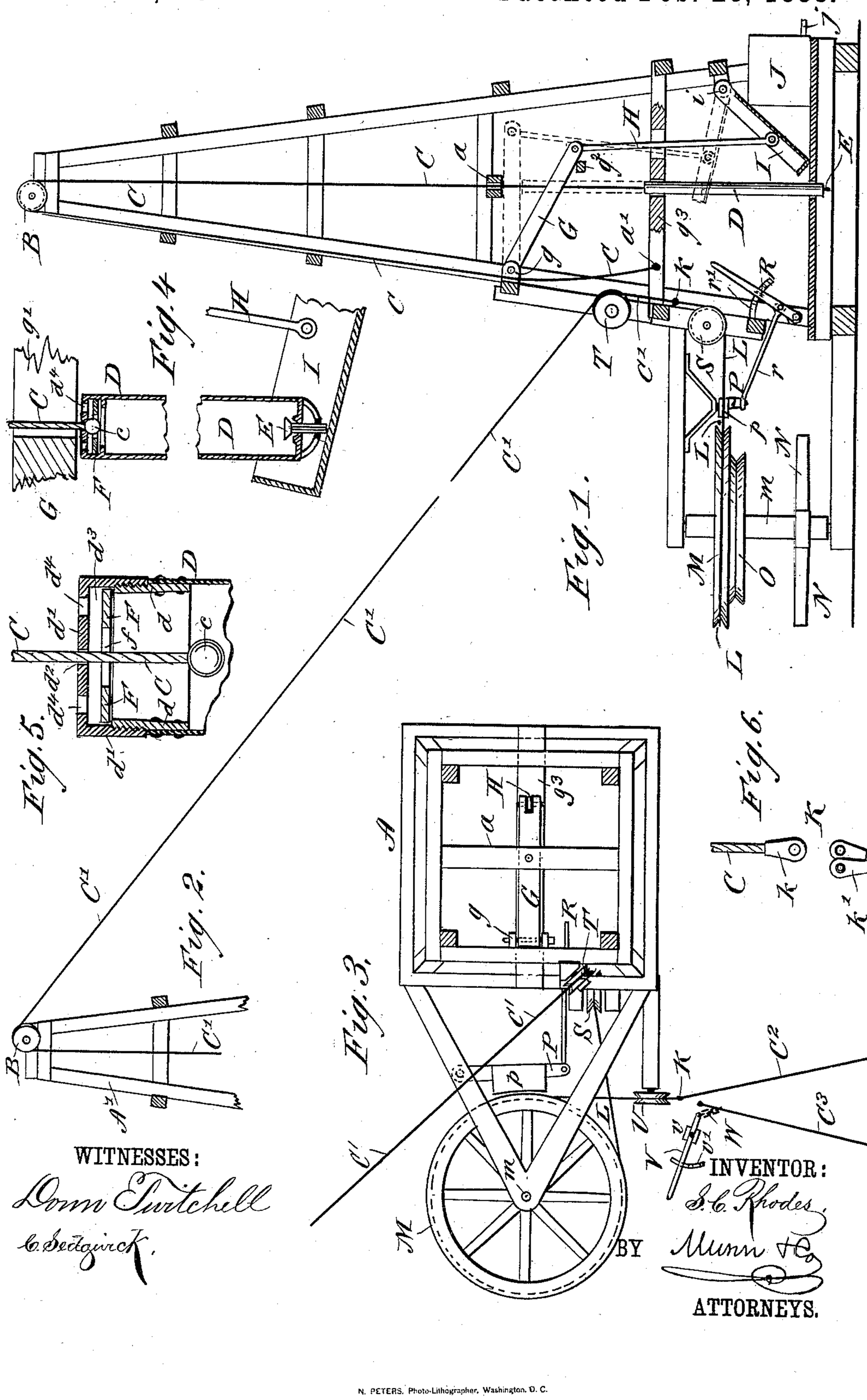
(No Model.)

S. C. RHODES.

SYSTEM OF BAILING WELLS.

No. 378,619. Patented Feb. 28, 1888.



WITNESSES:

Donn Twitchell

C. Sedgwick.

INVENTOR:

S. C. Rhodes,

BY Munn & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

SOLOMON C. RHODES, OF BRADFORD, PENNSYLVANIA.

SYSTEM OF BAILING WELLS.

SPECIFICATION forming part of Letters Patent No. 378,619, dated February 28, 1888.

Application filed September 28, 1886. Serial No. 214,788. (No model.)

To all whom it may concern:

Be it known that I, SOLOMON C. RHODES, of Bradford, in the county of McKean and State of Pennsylvania, have invented a new and Improved System of Bailing Wells, of which the following is a full, clear, and exact description.

My invention has for its object the introduction of an improved system of bailing wells to obtain water, oil, or other substance, and in a simple effective manner enabling the wells to be bailed with considerable economy of time and labor over other methods and means ordinarily employed for the purpose.

The invention will first be described, and then will be particularly pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a vertical sectional elevation of an oil-well derrick and apparatus arranged therewith in accordance with my invention. Fig. 2 is a sectional elevation of the top part of the derrick of another well, the bailer of which is to be operated from the driving-power shown in Fig. 1 by means of a rope or cable. Fig. 3 is a plan view of the apparatus shown in Fig. 1, with the derrick-posts in horizontal section. Fig. 4 is a detail view of the bailer, partly broken away, and adjacent parts of a lever, and of the trough into which the bailer discharges. Fig. 5 is an enlarged detail vertical sectional view of the head of the bailer and part of its hoist-rope, and Fig. 6 is a detail view of the coupling used to connect the bailer-ropes of two adjacent wells with the driving-power operating the bailers.

The derricks A of the wells to be bailed may have any usual or approved construction, and have crown-pulleys B, over which the rope C, leading from the bailer D, passes. The bailer D of each well will be fitted with the ordinary dart-valve E, opening upward at its bottom, and at its top the bailer is provided with a metal collar, *d*, which is placed within the bailer-body and is riveted thereto, and projects upward above the body, where it is externally screw-threaded to receive the screw-cap or head-piece *d'*, which is preferably screwed down to the top of the collar *d*. (See Fig. 5.) The cap *d'* has a central hole, d^2, through which the bailer-rope C passes, and the rope has a metal ball or enlargement, *c*, at its end, and said ball supports the weight of the bailer at the cap *d'* as the bailer is lifted, and the ball will carry the bailer-rope down into the bailer to accommodate different levels of fluid in two wells being bailed out at the same time, as hereinafter more fully explained.

In a space, d^3, between the top of the bailer-collar *d* and the end plate of the cap *d'*, there is placed loosely a plate or disk valve, F, which has a central hole, *f*, through which the bailer-rope C and its ball *c* may pass. This valve F may rest by gravity on the top of the collar *d*, and is also adapted to rise to the cap *d'* and close a series of holes, d^4, made in the end of the cap to cut off overflow of fluid from the bailer, said holes d^4 and the hole *f* of the valve serving as vents through which the air or gas may escape from the bailer as it is lowered into the oil or other fluid to fill as the valve E opens.

To the derrick A of each of the wells there is pivoted at *g* one end of a lever, G, which is slotted at *g'* for the passage of the bailer-rope C, and the outer end of this lever is connected to a rod, H, the lower end of which is pivoted to a trough, I, which is itself pivoted at one end, *i*, to the derrick. The head of the bailer is adapted to strike the lever G to raise it, and thereby raise the trough I, until the lever strikes a cross-timber, *a*, fixed to the derrick. The distance between the fulcrums *g i* of the lever G and trough I and their points of connection with the rod H is so proportioned that after the lower end of the filled rising bailer D leaves the derrick-floor the swinging end of the trough will pass directly under the end of the bailer, and the trough will swing upward quicker than the bailer and overtake it, and before or by the time the lever G strikes the derrick bar or stop *a* the valve E will have been opened by the contact of the rising trough I with it, as in Fig. 4, and held open a sufficient length of time to allow the bailer to discharge its contents into the trough, which in turn discharges the fluid or substance received from the bailer into a receiving trough or tank, J, on the floor of the derrick, and this tank may have a pipe-connection at *j* to convey the fluid to a pump, or to any other de-

sired place of discharge. The extreme upper positions of the bailer D, lever G, rod H, and trough I are indicated in dotted lines in Fig. 1 of the drawings, which also shows a cross-timber, g^2, of the derrick, onto which the lowered lever G rests when the trough I about reaches the derrick-floor, to relieve the trough I, rod H, and the end joints of the rod of strain by the weight of the lever. A cross-bar, g^3, on the derrick is provided with a hole, through which the bailer D passes, thereby guiding the bailer as it rises and falls, and insuring its entrance into the bore or casing of the well.

The free or outer end of the bailer-rope C of each of the wells is provided with a metal eye, *k*, which forms one half or part of a coupling, K, the other half or part, *k'*, of which is connected with a rope, L, which passes around the master-wheel M of the driving-power set up at one of the well-derricks about at the center of a group of wells. Each end of the driving rope or cable L will be provided with a part, *k'*, of a coupling, K, thus allowing the other part, *k*, of the bailer-ropes of any two wells of the group to be operated simultaneously by or from the rope L, in accordance with my system. The part *k* of the coupling consists of a pierced metal plate or eye, and the part *k'* is a forked metal piece, the ears or jaws of which are bored, thus allowing a pin to be passed through the parts *k k'* to easily couple the bailer and driving-ropes C L, and as easily uncouple them when required to connect the various wells of the group in pairs with the driving-power.

The master-wheel M is shown fixed to an upright shaft, *m*, to which are attached sweeps N, to which horses will be hitched for turning the master-wheel by animal-power; but, if desired, a driving-rope may be passed around a wheel, O, fixed to the wheel M, and thence to a wheel or pulley driven by steam or other power to operate the bailers. A brake-lever, P, pivoted to a suitable bracket or other part of the driving-power frame, carries a shoe, *p*, and the free end of this lever is connected, by a rod, *r*, with a lever, R, fulcrumed to the frame and within reach of a person who by operating it may press the brake-shoe *p* to the master-wheel to stop it quickly and hold it at rest, about at the time the bailer D of one of the two wells had lifted its lever G to the cross-timber stop *a* of the well-derrick preparatory to reversal of motion of the master-wheel to lower the emptied bailer and lift the filled one. The lever R may be held by a catch-plate, *r'*, on the derrick-frame to lock the brake to the master-wheel while the bailer is discharging, during which time the attendant may turn the horses hitched to the two sweeps N N, ready to reverse the motion of the master-wheel when the bailer is emptied and the brake is released. The holdback-straps of the horses' harness will be connected to the sweep in front of them, thus enabling the horses to stop or control the motion of the master-wheel should the next rising bailer come out of its well empty or but partly filled, or should the bailer be lost in the well.

Suitable sheaves or pulleys, as S T U, are journaled to the derrick A and the power-frame and serve as guides to the various bailer and power-transmitting ropes used in the work.

I purpose holding the uncoupled end of each of the bailer-ropes C not connected to the driving-rope L by means of a lever, V, journaled to a suitable post, *v*, or it may be a part of a derrick-frame, and I arrange a suitable catch-plate, *v'*, to hold the lever, to the end of which a few links of chain, W, will be connected, and a suitable device adapted to clamp the bailer-rope will be held by the chain, thereby allowing freedom of movement to effect a coupling of the bailer-rope with the power-rope. This lever V and connections (shown only in Fig. 3 of the drawings) give the necessary purchase to easily draw up the bailer-rope to the driving-rope to couple them.

I describe the continuous operation as follows: Fig. 3 of the drawings illustrates how the driving-power attached to the derrick A in Fig. 1 is made to operate a bailer-rope, C', of a well under the derrick A', and a bailer-rope, C^2, of another well. (Not shown.) In this case the opposite ends of the driving-rope L on the master-wheel are coupled to the ends of the bailer-ropes C' C^2. The rope C of the bailer D of the well beneath the derrick A is shown uncoupled and hung over a hook, *a'*, fixed to the derrick, and the bailer-rope C^3, leading from another well to be bailed at the same time with the well beneath the derrick A, is shown uncoupled from the driving-rope and held by the lever and links V W. A like lever-and-chain device may of course be arranged on the derrick to hold the rope C. It is obvious that as the wheel M is turned in one direction one of the connected pair of bailers will descend into its well to be filled, and its gravity will assist the rise of the filled bailer from the other well, thus economizing the driving-power. As the filled bailer is lifted to its full height and the lever G strikes the cross-beam *a* of its derrick, the brake P will be applied to the master-wheel to hold it until the motion of the sweep N or of the driving-rope connected to the wheel O is reversed, whereupon the brake will be taken off and the now emptied bailer will descend as the newly-filled bailer is lifted by turning the wheel M in the reverse direction from that in which it was before rotated. As the bailers fill, the valve F is floated against the bailer-cap to close its holes d^4, and as the trough I opens the bailer-valve E the valve F will fall to open the holes d^4 and give freer vent to insure prompt discharge of the contents of the bailer into the trough. Should one of the wells be deeper than the other, the weighted ball *c* of the rope of the bailer in the well having the highest fluid-level will carry the rope down

into the bailer more or less until the other filled or discharging bailer reaches the limit of its rising movement, as will readily be understood.

It will be noticed that by the use of a driving or hoisting power applied at or set up near one of the wells at the center of a group of wells and the automatic bailer-discharging devices herein described any two wells of the group anywhere within a distance of from six hundred to a thousand feet apart or from the driving-power may be bailed out at once, and both wells may be bailed with one man at the lever R, and who may also attend to the horses hitched to the sweep, and when steam-power is used the steam-valves may be controlled by him from his place at the brake-lever to secure reversals of motion of the master-wheel.

It is evident that by the aid of suitable guide sheaves or pulleys a pair of wells having any positions relatively to the driving-power and to each other may be bailed simultaneously, and the bailer-ropes of grouped wells may be very quickly coupled to and uncoupled from the driving-power; hence a number of wells may be kept bailed out by the aid of a single driving-power with very little trouble and expense. Where there are but two wells to be bailed out, the bailer-ropes need not be provided with the detachable couplings K, but will be made fast to the ends of the master-wheel rope L; or this rope L and the bailer-ropes may be but one rope passed around the master-wheel and over the crown-pulleys at the two derricks, and carrying the bailers at its opposite ends.

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

1. In a system of bailing wells, the combination of a master-wheel, a driving-rope thereon, two ropes attached each at one end with a bailer by a slip connection, and said bailer-ropes connected at their other ends with opposite ends of the master-wheel driving-rope, substantially as shown and described, whereby wells having unequal fluid-levels may be bailed by alternate operation of the two connected bailers, as set forth.

2. The combination, with the bailer D and its suspending-rope C, adapted to slip through a hole, d^2, in the bailer-head, and said head provided with vent-holes d^4, of a loose valve, F, having a hole, f, for the passage of the enlarged end or head c of the bailer-rope, and adapted to close the vent-holes d^4, substantially as shown and described.

3. The bailer made with an internal collar, d, a cap, d', fitted externally on the collar d, a valve, F, supported on said collar in a space between it and the end of the bailer, and the bailer having holes d^4, which the valve is adapted to close, substantially as shown and described.

SOLOMON C. RHODES.

Witnesses:
P. M. SHANNON,
L. J. ELLIS.