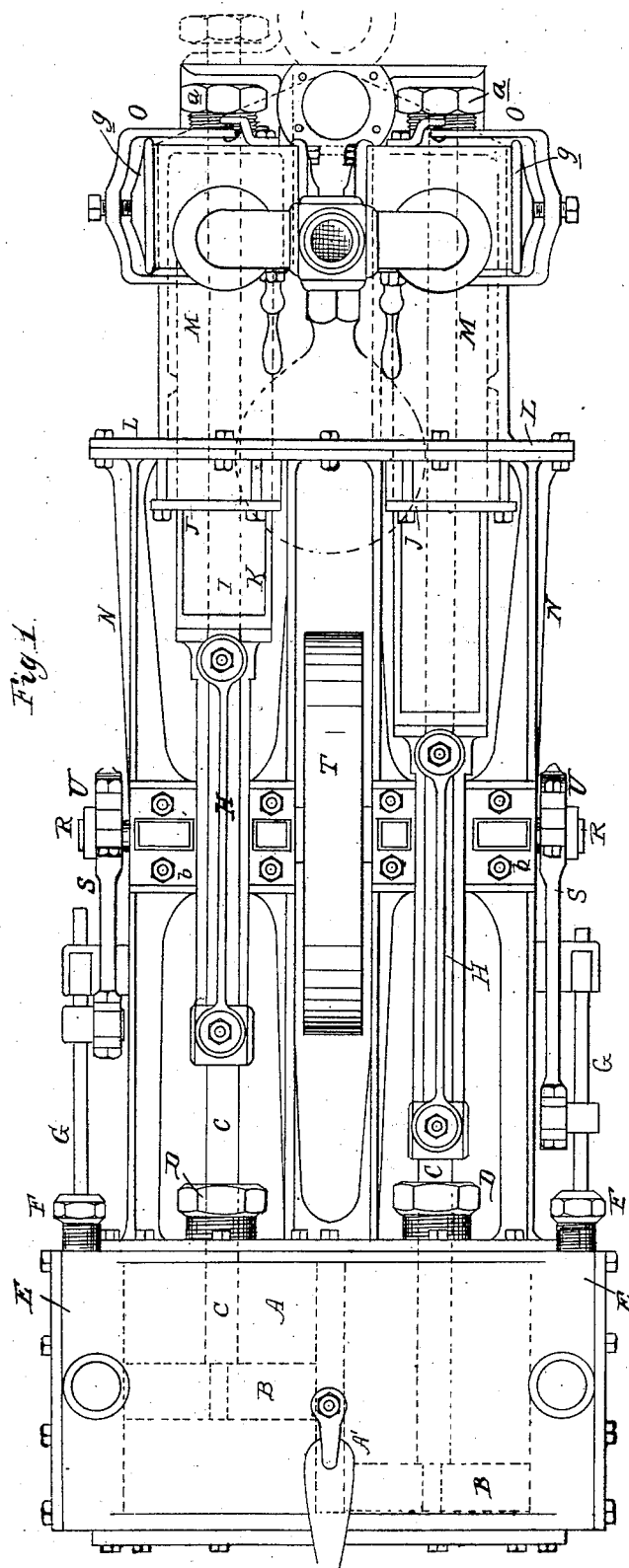


W. M. FERRY.
STEAM PUMPING ENGINE.

No. 266,026.

Patented Oct. 17, 1882.



Attest:
J. Sprague,
C. Sully,

Inventor
W. M. Ferry
By J. Sprague
Atty.

(No Model.)

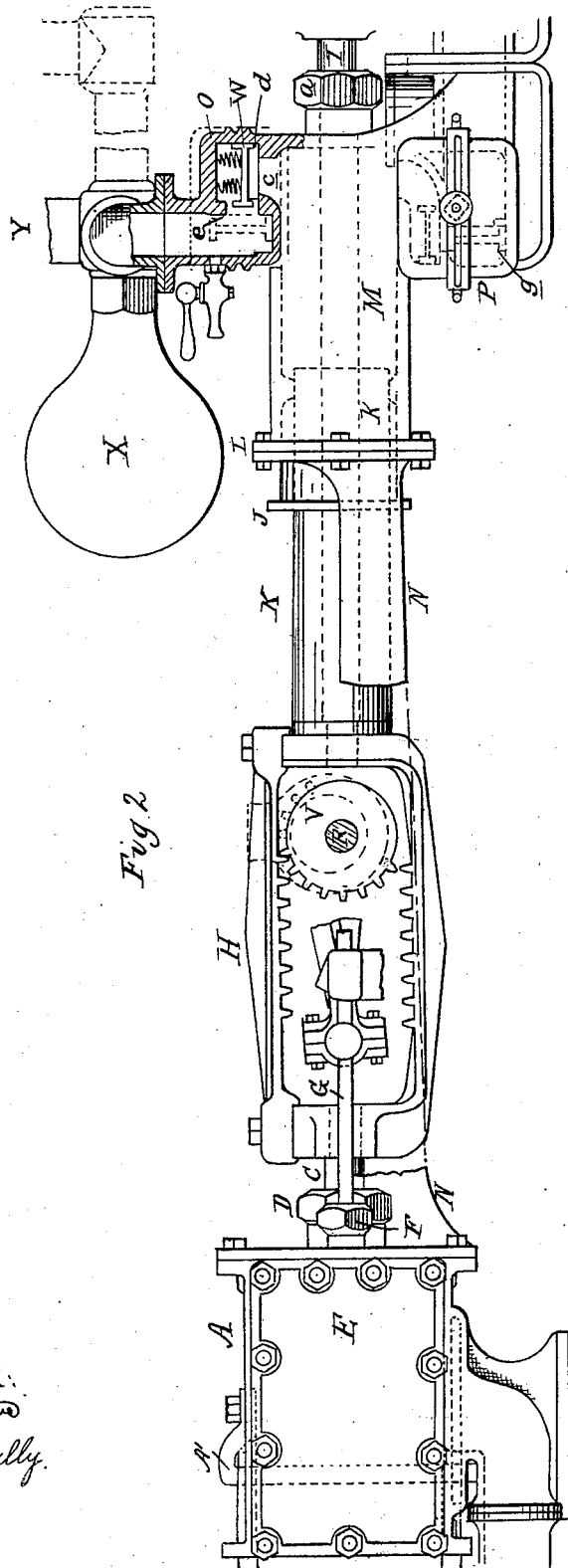
3 Sheets—Sheet 2.

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STEAM PUMPING ENGINE.

No. 266,026.

Patented Oct. 17, 1882.



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H. P. Wray
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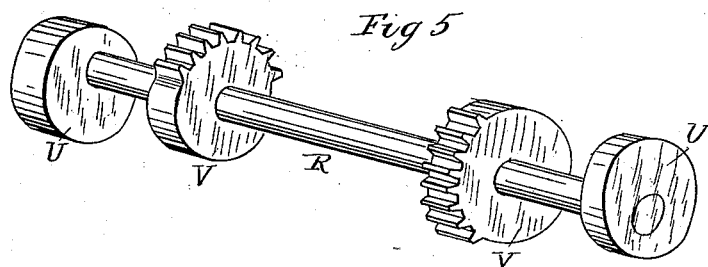
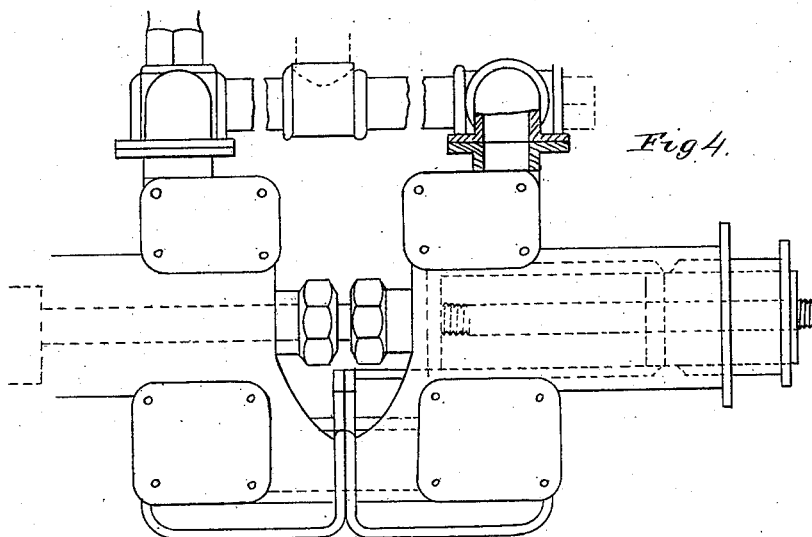
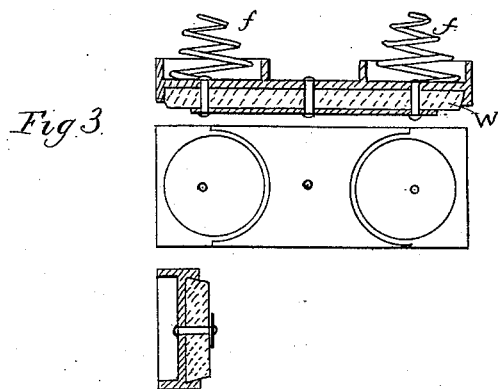
(No Model.)

3 Sheets—Sheet 3.

W. M. FERRY.
STEAM PUMPING ENGINE.

No. 266,026.

Patented Oct. 17, 1882.



Attest:
A. S. Sprague
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UNITED STATES PATENT OFFICE.

WILLIAM M. FERRY, OF PARK CITY, UTAH TERRITORY.

STEAM PUMPING-ENGINE.

SPECIFICATION forming part of Letters Patent No. 266,026, dated October 17, 1882.

Application filed March 29, 1882. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM M. FERRY, of Park City, in the county of Summit and Territory of Utah, have invented new and useful Improvements in Steam-Pumps; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

10 The nature of this invention relates to certain new and useful improvements in steam pumping-engines, by means of which they may be used in a horizontal or vertical position, and so constructed that they may be operated
15 as single or double acting pumps, whereby under the varying circumstances under which they are used the entire steam force may be utilized.

20 The invention consists in the peculiarities of construction of parts and their various combinations, as more fully hereinafter described.

Figure 1 is a plan view. Fig. 2 is a side elevation. Fig. 3 is an enlarged detail of the water-way valves. Fig. 4 is a detail partly in
25 section, showing the manner of connecting additional pumps in the series to the same plunger-rod. Fig. 5 is a detached view, enlarged, of the shaft and its connections.

In the accompanying drawings, A represents
30 a steam-cylinder, two of which, of equal size, are placed side by side and secured together in any of the ordinary ways, or cast together, as may be most convenient. Each of these
35 cylinders is provided with a steam-chest, E, within which ordinary D-valves are employed to alternately close and disclose the inlet and exhaust ports, which are also of any of the usual constructions. Each one of these cylinders is provided with a piston, B, piston-rod
40 C, and stuffing-box D. Each steam-chest is provided with its stuffing-box F and valve-stem G. The free end of the piston-rod of each of these cylinders is secured to the yoke H, and to the opposite end of this yoke is secured the
45 plunger-rod I of the pump. In Fig. 2 the details of the construction of this yoke are more fully shown, where it will be seen that the two opposite inner faces of the yoke are provided with teeth or cogs, so that each side forms a
50 rack.

M represents two water-cylinders or pump-

chambers, standing side by side, with their axes in line with the axis of the piston-rods of the two steam-cylinders, and these two water-cylinders are provided with flange-heads L, by
55 means of which they are secured to the body-piece N, the opposite end of which is secured to the ends of the steam-cylinders. Each of these water-cylinders is provided with a stuffing-box, J, through which the plungers K re-
60 ciprocate, said plungers being hollow to allow the plunger-rod to pass through them and through stuffing-boxes a at the opposite end of these water-cylinders. Midway between the
65 steam and water cylinders the body-piece is provided with bearings and boxes b to carry the shaft R, which in turn carries the fly-wheel T, the eccentrics U, and the semi-toothed pinions V. The teeth or cogs upon these pinions
70 fill only a portion of the periphery, while the balance presents a plain surface, and they are so arranged that the teeth will alternately engage with the opposite sides of the racked yoke, thereby converting the reciprocating motion of the piston into a continuous rotary motion
75 of the shaft, which gives proper motion to the eccentrics U, and thereby alternate reciprocating motions to the valve-stems G and the valves thereto attached within the steam-chests.

O represents the discharge-valve chamber, into which the water-way c leads from the water-cylinder. This valve-chamber is provided with a horizontal valve-seat, d, and a vertical
80 valve-seat, e, standing at right angles to each other. But one valve, however, is provided for this chamber, the construction of which valve is shown in enlarged detail in Fig. 3, and is held in place by the springs f' and covers g of the
85 chamber. In Fig. 2 this valve W is shown in place when the pump is acting horizontally. Should it become necessary to change the position of the pump to a vertical one, the covers g are lifted off and the valves W are taken out and seated upon the seats e, when the cover is
90 replaced and secured.

P represents the suction-valve chamber, which in its construction and operation and in its provision of valves and seats is precisely like the description given of the valve-chamber O.

X is the air-chamber, attached to the dis-

charge-valve chamber shown in Fig. 2, as though the pump were in a vertical position. When the pump is in a horizontal position such air-chamber should stand vertical to the valve-chamber. Y is the discharge-outlet.

Should circumstances require the duplicate of this water-cylinder, with its suction and discharge valve chambers, a plunger is secured to the one already described, and a connection by any suitable means, like a screw-joint, connects its plunger with the plunger-rod I, and so on these pumps may be added in line and in series, with their plungers and plunger-rods connected, so that the plunger-rod really becomes one rod through the whole series of pumps in line.

The steam-cylinders A are provided with a bail, A', or other analogous device, by means of which the pump may be vertically and adjustably suspended over the body to be acted upon by attaching said bail to any of the known hoisting apparatus. This adapts the pump to be lowered into the shafts of mines, and by means of the hoisting apparatus allow the pump to fall and act upon the falling surface of the water as such water is discharged by means of the pump.

The covers to the valve-chambers of the water-cylinders are secured in place by hinged bails, as shown, which greatly facilitates access to the interior of said valve-chambers when desirable.

I do not in this application make specific

claims to the construction and arrangement of the valves, valve-seats, the manner of securing the valve-chambers of the pump proper, or the pump proper, as I intend to file a separate application embodying these features.

I am aware of the patent of T. A. Mitchell, dated June 22, 1869, No. 91,555, and I do not therefore claim as my invention a device for converting motion consisting of a mutilated gear-wheel working within a racked yoke.

What I claim as my invention is—

1. A steam-pump consisting of two steam and two water cylinders secured together upon the same axial line and provided with a continuous plunger, in combination with yokes and mutilated gear-wheels for converting the reciprocating motion of the piston into rotary motion of the shaft, and eccentric and valve connections operated by said shaft, and communicating alternating motion to the valves of each of the steam-cylinders, substantially as set forth.

2. In a steam-pump having two steam-cylinders and two water-cylinders secured together, the steam-pistons, and water-plungers, combined with the yoke H, having internal rack-bars, the shaft R, carrying segmental gears V and eccentrics U, and with the valve-stems G and steam-valves, as set forth.

WM. M. FERRY.

Witnesses:

H. S. SPRAGUE,
E. SCULLY.