

No. 676,542.

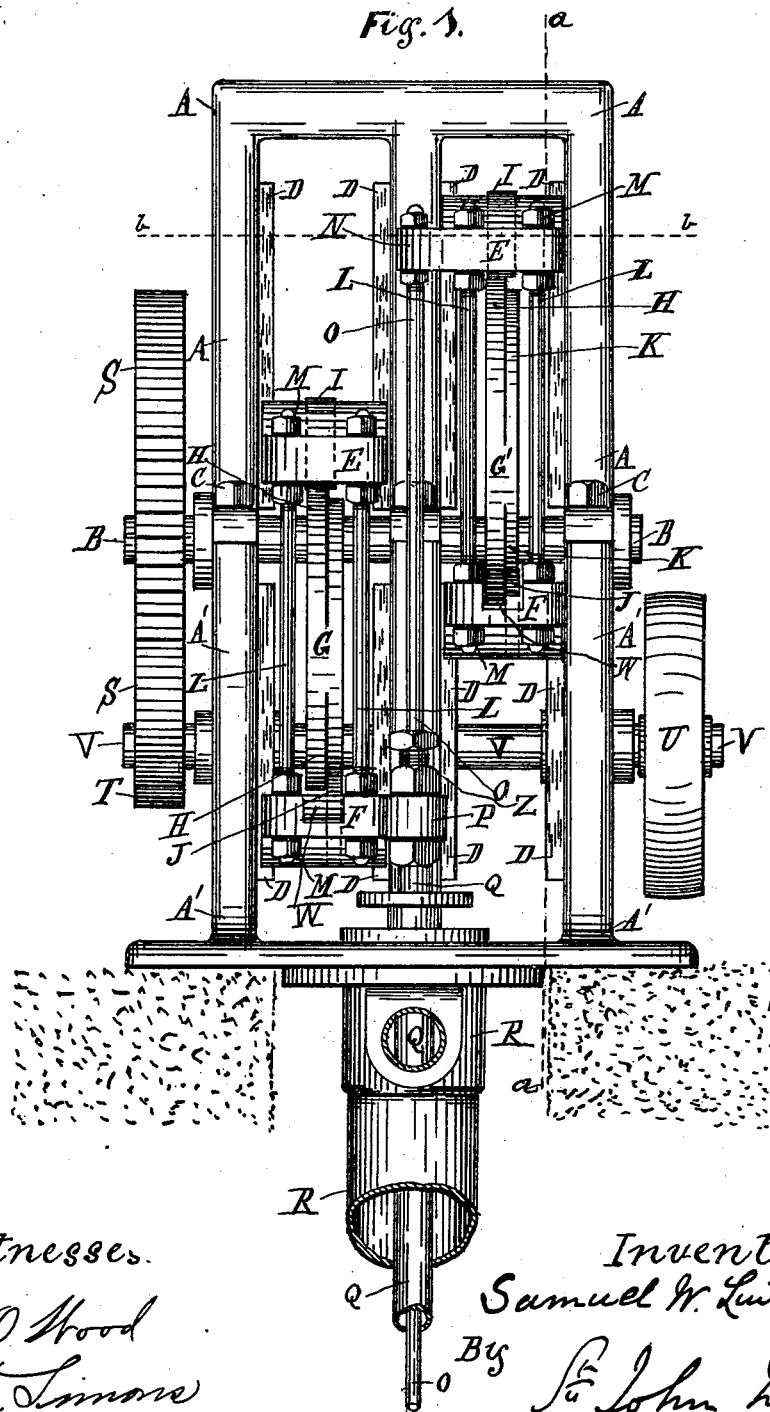
Patented June 18, 1901.

S. W. LUITWIELER.
PUMPING AND RECIPROCATING MECHANISM.

(No Model.)

(Application filed Oct. 11, 1899.)

4 Sheets—Sheet 1.



Witnesses.

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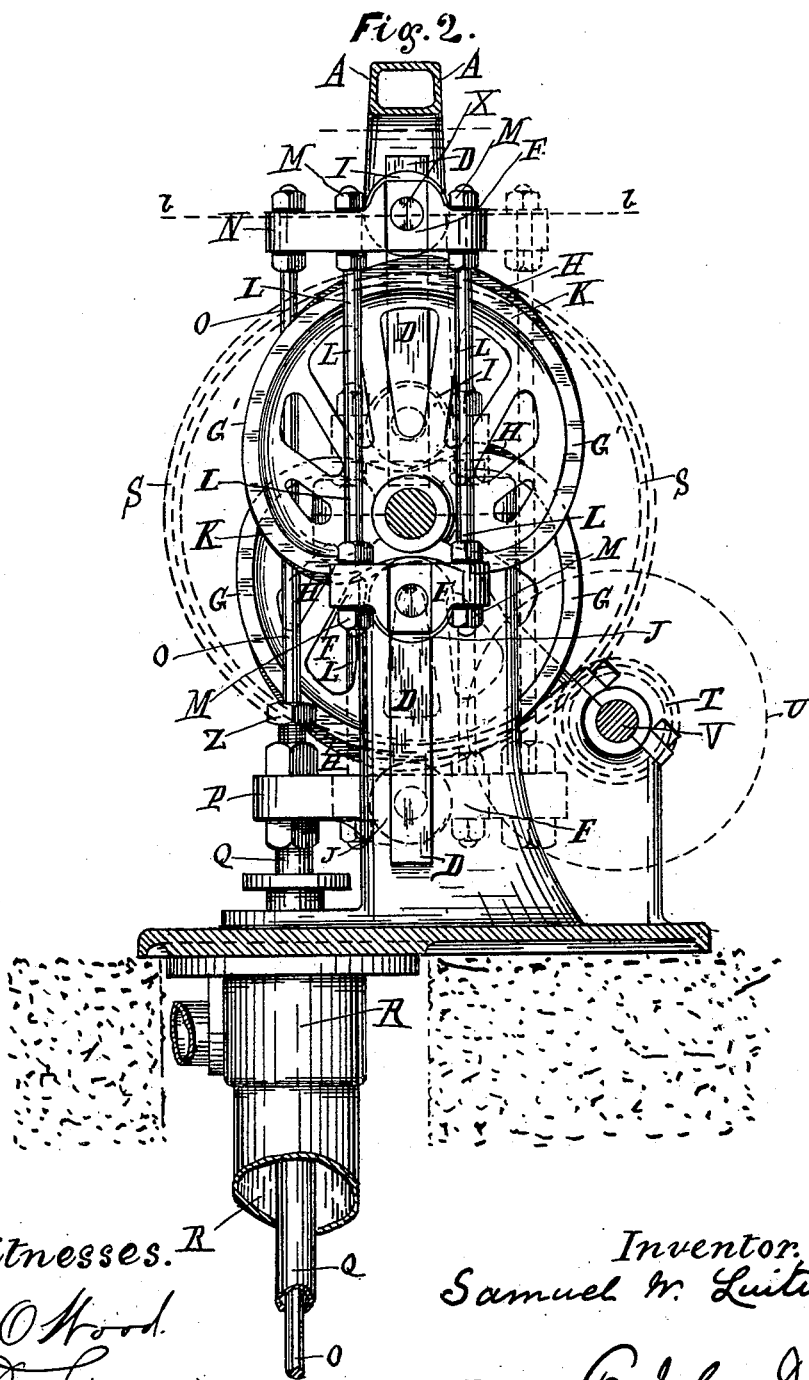
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4 Sheets—Sheet 2.



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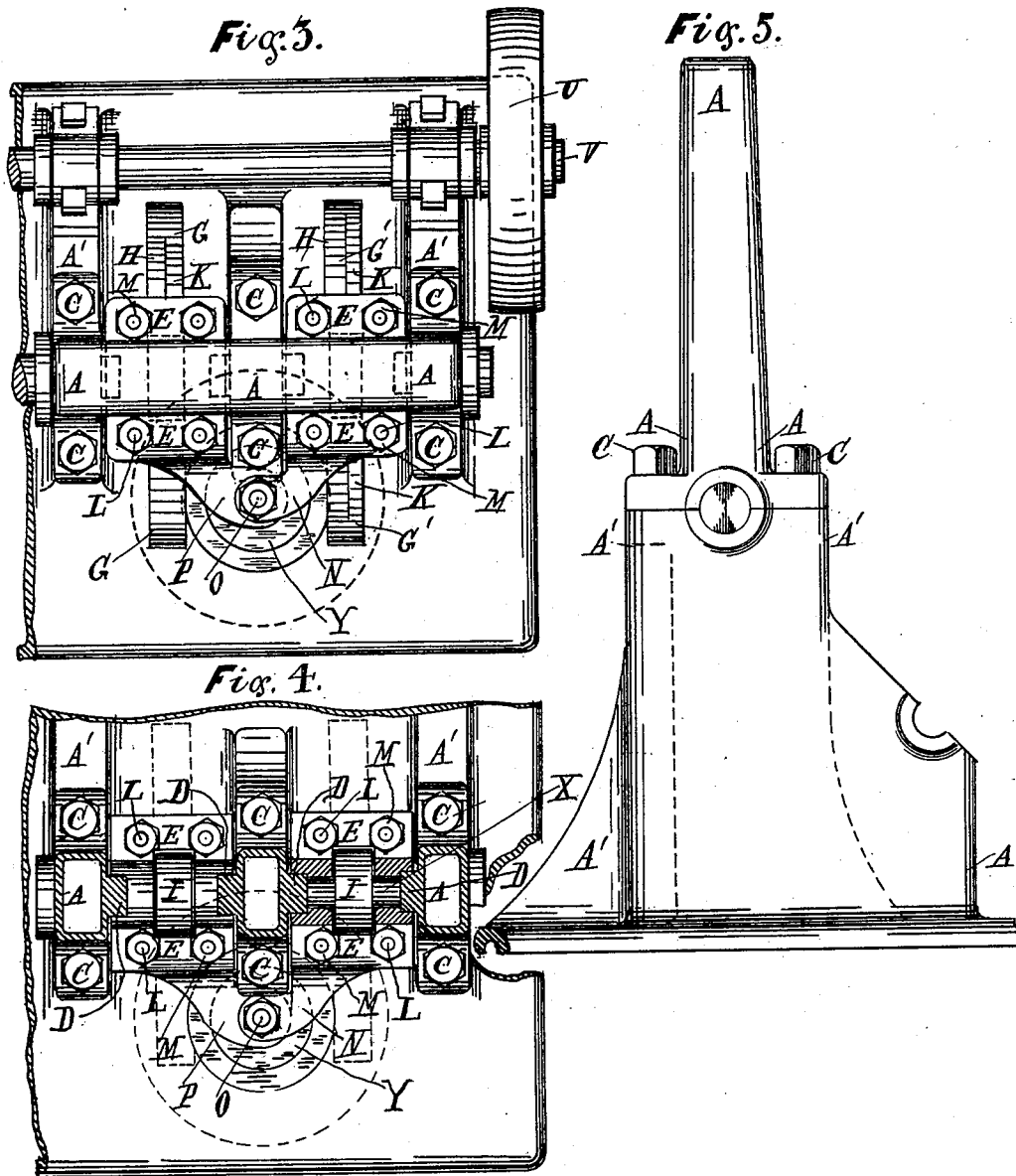
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4 Sheets—Sheet 3.

(No Model.)



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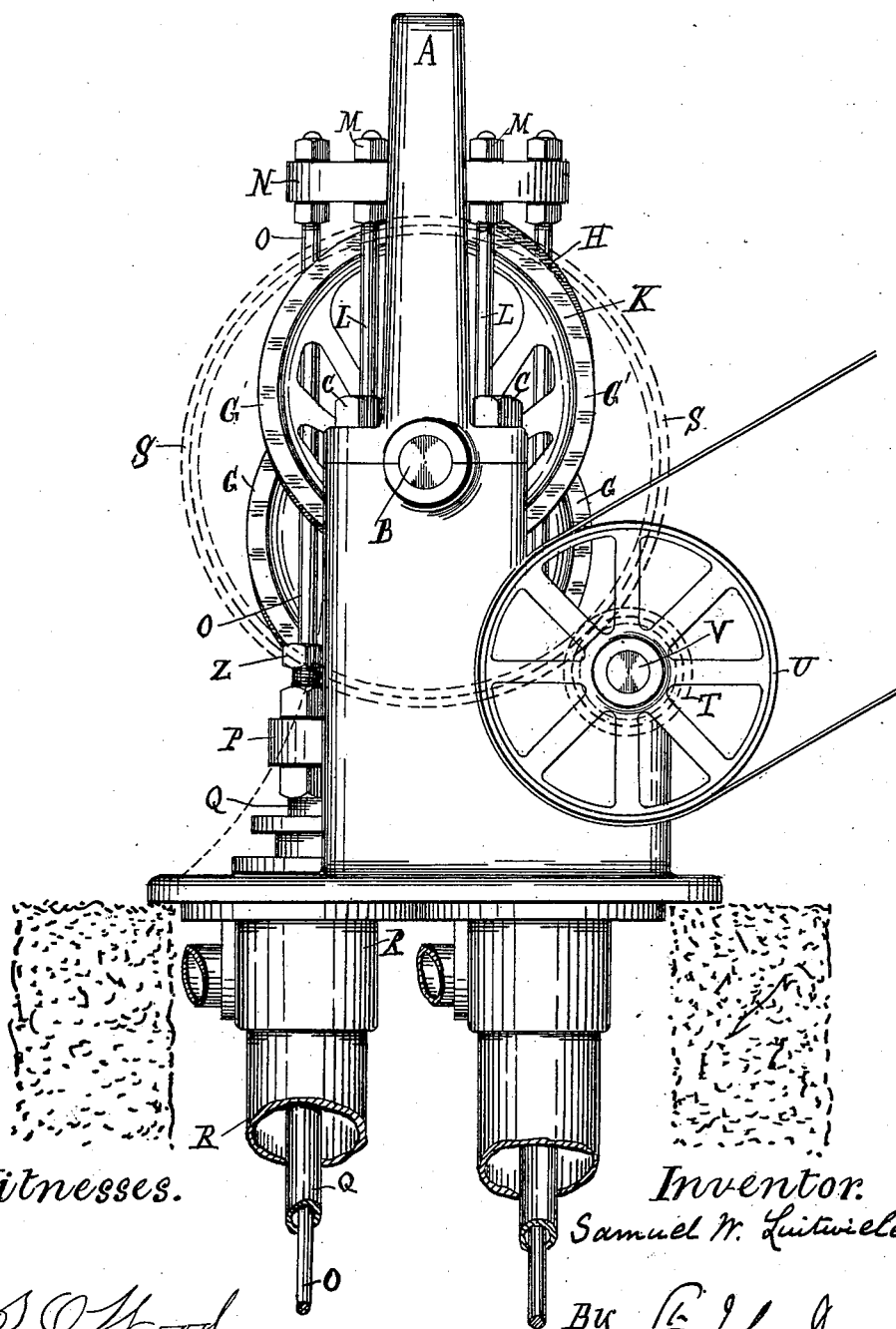
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4 Sheets—Sheet 4.

Fig. 6.



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UNITED STATES PATENT OFFICE.

SAMUEL W. LUITWIELER, OF LOS ANGELES, CALIFORNIA.

PUMPING AND RECIPROCATING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 676,542, dated June 18, 1901.

Application filed October 11, 1899. Serial No. 733,330. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL W. LUITWIELER, of the city of Los Angeles, county of Los Angeles, and State of California, have invented certain new and useful Improvements in Pumping and Reciprocating Mechanism, of which the following is a full, clear, and exact description or specification, reference being had to the annexed sheets of drawings, and to the letters marked thereon.

My invention relates to that class of reciprocating mechanism used more especially for operating double-plunger pumps—that is to say, that class of pumps in which two pump plungers or buckets are used in the same pump barrel or cylinder, one bucket or plunger being above the other, with a sufficient space between them to enable their reciprocating movements to be made without interference of one pump bucket or plunger with the other pump bucket or plunger, the upper pump bucket or plunger being connected to a tubular pump-rod and the lower pump bucket or plunger being connected to another pump-rod, which is operated through the tubular pump-rod of the upper bucket or plunger.

My present improvements in mechanism of the kind referred to have for their object principally simplification of the mechanism used in driving pumps of the class hereinbefore referred to, while my improvements also have for their object to render the cam-frames to which the pump-rods are connected adjustable in relation to the pump-rods and also adjustable in relation to the cams which operate the cam-frames and pump-rods, while a further object of my present improvements is to enable the pump itself and its operating parts to be brought to the front of the framing of the pump, and in cases where my improved mechanism is used for operating two pumps, which it is equally adapted to operate without altering the construction of the mechanism, then the second pump is placed in the same position at the rear of the framing that the single pump (when a single pump alone is used) occupies in relation to the front part of the framing. In this way I am enabled to utilize the operating or driving gear of the pump for operating two pumps in place of a single

pump as hitherto. This object I attain by constructing the cross-heads and cross-tails alternately of the adjustable cam-frame forming part of this invention with offsets projecting from the front or from the front and back and then turned toward the center of the framing, so as to be centrally over the pump-rods to which they are connected.

The framing of my improved pumping and reciprocating mechanism in place of being constructed as hitherto is formed in two portions, which are united by a joint at the axis of the cam-shaft by bolts.

On the annexed drawings, Figure 1 is a front elevation of my improved reciprocating mechanism for operating double-plunger pumps. Fig. 2 is a view at right angles to Fig. 1, showing the framing in section on the dotted line *a a*, Fig. 1, and the driving mechanism and the rest of the framing in end elevation. Fig. 3 is a plan of my improved reciprocating mechanism for operating double-plunger pumps. Fig. 4 is a horizontal section of the same on the line *b b*, Figs. 1 and 2, showing part of the framing and part of the mechanism in section and part in plan. Fig. 5 is an elevation of the framing. Fig. 6 is an end elevation of my reciprocating mechanism operating two pumps.

As shown by the figures, the framing is constructed of the upper part A and the lower part A'. These two parts of the framing A and A' are connected by a joint on the level of the axis of the cam-shaft B and are fastened by bolts C, as shown. The inner vertical faces of the framing A and A' have cast in one piece with them the slides or motion-bars D D, each of which extends a sufficient length vertically upward and downward within the framing to enable the cross-heads E and cross-tails F to slide freely and reciprocatingly thereon while providing rigid vertical support for the cross-heads and cross-tails constituting the upper and lower ends of the cam-frames. Upon the cam-shaft B there are carried two cams G and G', respectively. These cams G and G' are formed with projecting portions H H, corresponding with similar projecting portions in Letters Patent No. 629,039, granted to me July 18, 1899, the

difference between the cams shown in the annexed drawings and that shown, described, and claimed in the aforesaid Letters Patent being that the projecting portions H are arranged at one side of the cam in place of along the center thereof, as in the cams comprised under the Letters Patent aforesaid. The cross-heads of my improved cam-frame are provided with antifriction-rollers I, against which the projecting members H of the cams operate, and the cross-tails F are provided with antifriction-rollers J, against which the depressed or recessed portions K of the cams operate.

The cross-head E and the cross-tail F of each cam-frame are connected together by metallic rods L L, respectively, which are provided with adjusting-nuts M M M M at their upper and lower ends to enable the distances apart of the cross-head and cross-tail of each cam-frame to be adjusted both in relation to themselves, in relation to the cams G G', and in relation to the pump-rods. The cross-heads and cross-tails E and F, respectively, of the improved cam-frame are formed with rectangular grooves for engaging with or sliding upon the slide-bars D D. The cross-head E of one of the cam-frames is constructed with an offset N, to which the inner pump-rod O—that is to say, the pump-rod which operates the lower pump bucket or plunger—is connected, and the cross-tail F of the other cam-frame is provided with an offset P, to which the tubular pump-rod Q of the upper bucket or plunger is connected. In this way by means of the cams G and G' the cam-frames are operated in close proximity to each other and with the offset of one cam-frame immediately above the offset of the other cam-frame without the two offsets interfering with each other and in such manner that the pump-rods O and P, and thereby the pump itself, may be placed in a central position immediately in front of the framing of the mechanism. By extending the offsets of the cross-heads and cross-tails, respectively and alternately, of each cam-frame to the rear of the framing, as shown by dotted lines in Fig. 2 and in end elevation at Fig. 6, then a second pump similar to the pump R and coupled to pump-rods similar to O and Q, as shown in dotted lines in Fig. 2 and in Fig. 6, may be operated by one and the same pump mechanism. The cam-shaft in my improved pump-operating mechanism is as in pump mechanism for which I have applied for Letters Patent of previous date hereto provided with a spur-wheel S for operating the same by means of the pinion T, gearing into said spur-wheel S and together driven by a belt upon the pulley U upon the counter-shaft V.

In order to allow the under part of the cam when in the position shown by the cam G' in Figs. 1 and 2 to pass freely and without coming in contact with the cross-tail F, the cross-tails F are each formed with the recess

W, as shown in Fig. 1 and in dotted lines at Fig. 2.

The antifriction-rollers I and J in the cross-heads and cross-tails, respectively, of my improved cam-frame are carried upon pins X, which are slipped through holes in the cross-heads and cross-tails, respectively, and in antifriction-rollers.

The head of the pump is provided with a stuffing-box in which the gland Y is used, and the hollow piston-rod Q is also provided with a stuffing-box in which the gland Z is used, both stuffing-boxes being provided with packing in the usual manner, as is well understood.

Having now described the nature of my said invention and the best mode, system, or manner I am at present acquainted with for carrying the same into practical effect, I desire to observe in conclusion that what I consider to be novel and original, and therefore claim as the invention to be secured to me by Letters Patent, is as follows:

1. The combination of the double-plunger pump, the differential cams, the adjustable cam-frames, the cross-head of one of the cam-frames having a curved offset connecting it to the pump-rod of the lower bucket and the cross-tail of the other cam-frame having an oppositely-curved offset connecting the cam-frame to the tubular rod of the other bucket, both pump-rods and the ends of both offsets occupying a central position in front of and external to the framing carrying the pumps beneath the base-plates thereof, substantially as set forth.

2. The combination of two plunger-pumps, two differential cams, two adjustable cam-frames with front and rear curved offsets of the cross-head of one of the cam-frames connected to the rods of the lower buckets of two pumps, and the front and rear curved offsets of the cross-tail of the other cam-frame being connected to the tubular rods of the other buckets, the pumps and curved offsets on the front and rear cross-heads and cross-tails of the cam-frames projecting externally and at a central position at both the front and rear of the pump-framing, substantially as described.

3. The combination of two double-plunger pumps, two differential cams, two differential cam-frames, the front and rear oppositely-curved offsets of the cross-heads and cross-tails of the cam-frames respectively connected to the pump-rods, the pump-rods and curved offsets being situated centrally at the front and rear of the framing centrally and externally thereto, substantially as hereinbefore described.

4. The combination of two double-plunger pumps, two differential cams two adjustable cam-frames with front and rear oppositely-curved offsets of the cross-heads and cross-tails, respectively, the pumps at the front and rear of the framing situated centrally and ex-

ternally thereto, the gearing for operating the shaft on which the differential cams are carried and the framing constructed of upper and lower parts separable at the axis of the cam-shaft, substantially as hereinbefore described.

In testimony whereof I have hereunto set

my hand and seal, in the presence of two subscribing witnesses, this 27th day of July, 1899.

SAMUEL W. LUTWIELER. [L. S.]

Witnesses:

ST. JOHN DAY,
JOHN SATTERWHITE.