

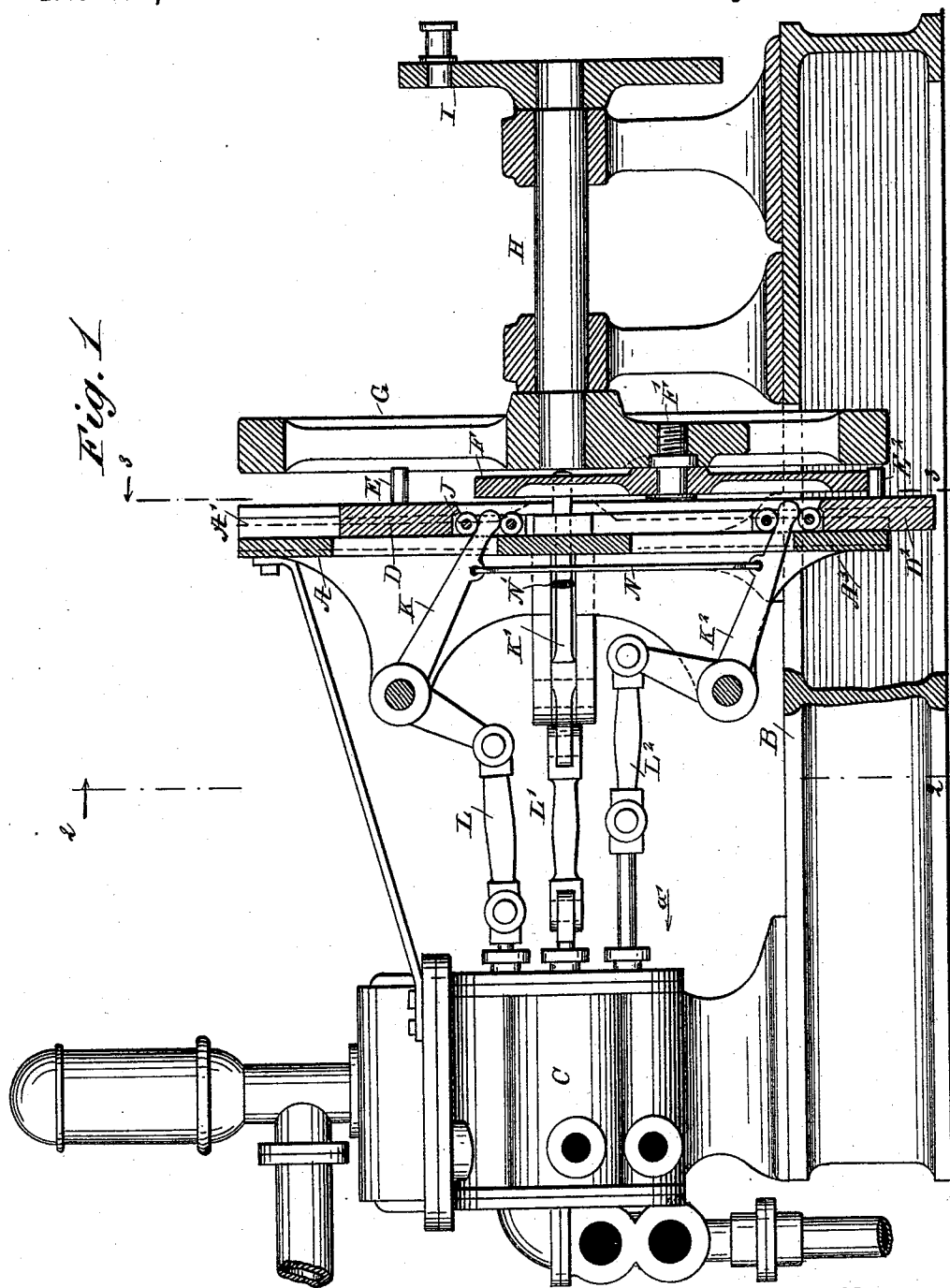
(No Model.)

2 Sheets—Sheet 1.

S. L. FULFORD.
GEARING FOR PUMPS.

No. 498,109.

Patented May 23, 1893.



WITNESSES:

C. Newell
W. Sedgwick

INVENTOR

S. L. Fulford
BY *Munn & Co.*

ATTORNEYS.

(No Model.)

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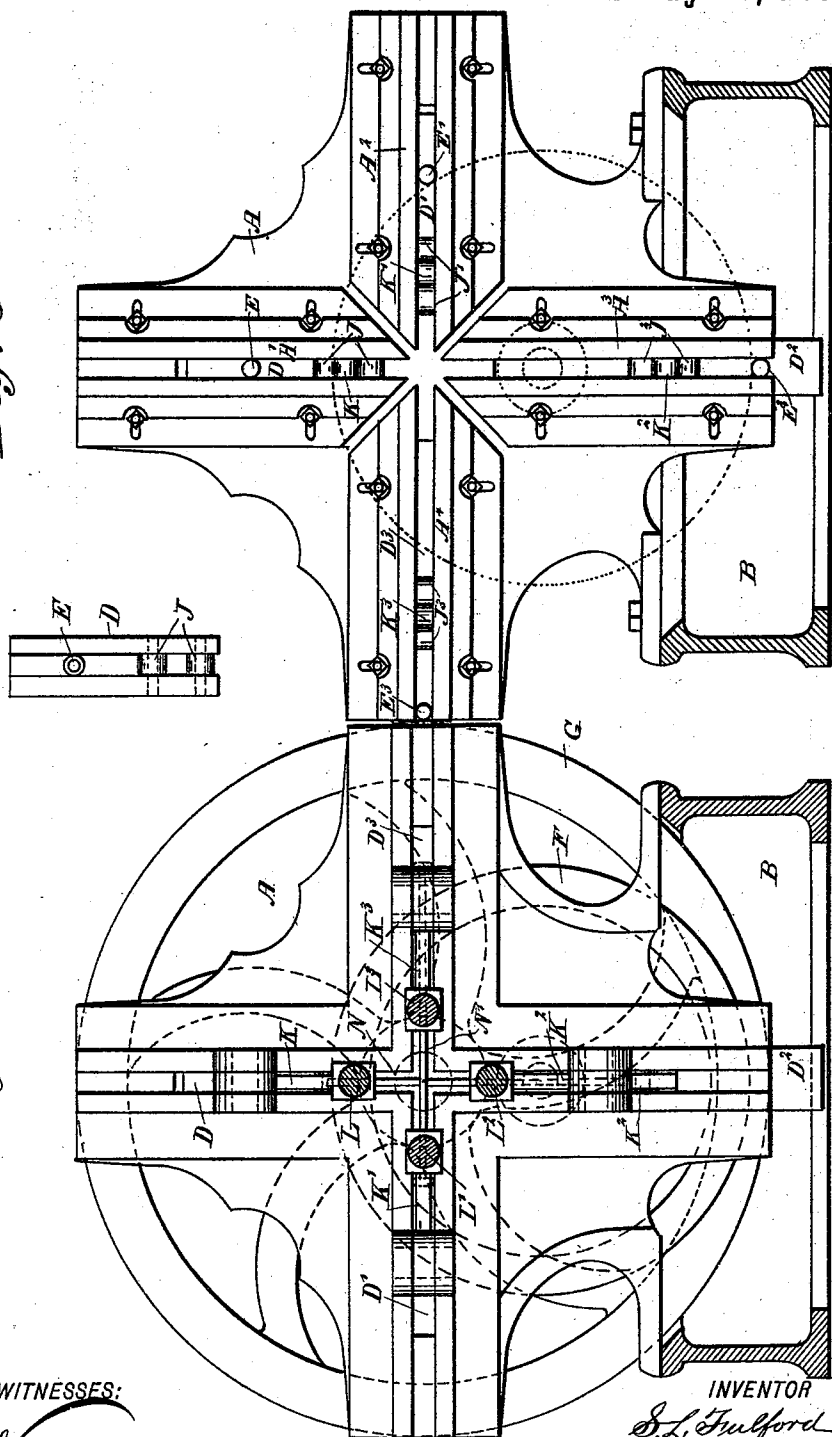
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Fig. 3

Fig. 4

Fig. 2



WITNESSES:

C. Neveu
Co. Sedgwick

INVENTOR

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UNITED STATES PATENT OFFICE.

STANLEY L. FULFORD, OF LOS ANGELES, CALIFORNIA.

GEARING FOR PUMPS.

SPECIFICATION forming part of Letters Patent No. 498,109, dated May 23, 1893.

Application filed January 16, 1893. Serial No. 458,504. (No model.)

To all whom it may concern:

Be it known that I, STANLEY L. FULFORD, of Los Angeles, in the county of Los Angeles and State of California, have invented a new and Improved Pump-Gear, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved pump gear, which is simple and durable in construction, very effective in operation and arranged to successively and rapidly actuate a number of pumps with the full power of the motor.

The invention consists of a series of cross heads mounted to slide in stationary bearings, and connected with the pump plungers to successively reciprocate the same.

The invention also consists of certain parts and details, and combinations of the same, as will be hereinafter described and then 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 sectional side elevation of the improvement as applied. Fig. 2 is a transverse section of the same on the line 2—2 of Fig. 1. Fig. 3 is a similar view of the same on the line 3—3 of Fig. 1; and Fig. 4 is a face view of one of the cross heads.

The improved pump gear is provided with a transversely-arranged and vertically-disposed plate A secured at its lower end on the bed plate B carrying the quadruplex pump C of any approved construction. On one face of the plate A are arranged the guideways A', A², A³ and A⁴ radiating from the center of the plate so that the guideways A', A³ are vertically-disposed and at right angles to the horizontally-disposed guideways A² and A⁴. In the guideways are fitted to slide the cross heads D, D', D² and D³ respectively, carrying pins E, E', E² and E³ respectively adapted to be engaged by the periphery of a wheel F journaled on a pin F' secured to one of the spokes of a fly wheel G fastened on a shaft H arranged in line with the axial line of the pump C and the center of the plate A. The outer end of the shaft H carries a crank disk I connected with suitable machinery for imparting a rotary motion to the said shaft H, so that the latter by the fly wheel G and the

crank pin F' carries the wheel F around, so that the latter imparts a sliding motion to the several pins E, E', E² and E³, and their corresponding cross heads D, D', D² and D³.

In the cross heads D are journaled the sets of friction rollers J, J', J² and J³, respectively, engaged by the bell crank levers K, K', K² and K³ respectively, fulcrumed on suitable brackets projecting from the inner face of the plate A. The bell crank levers K, K', K² and K³ are pivotally connected by links L, L', L² and L³ respectively, with the plungers of the quadruplex pump C.

It is understood that the cylinders of the quadruplex pump C are arranged in a circle the center of which is in an axial line with the shaft H and the center of the plate A, the axial line of the cylinders passing through the centers of the guideways A', A², A³ and A⁴. The oppositely arranged bell crank levers K and K² are connected with each other by a link N and the other bell crank levers K' and K³ are likewise connected with each other by a link N' so that the two oppositely-arranged and connected bell crank levers operate simultaneously.

The operation is as follows: When the shaft H is rotated, a sliding motion is given to the several cross heads D, D', D² and D³, from and toward the center of the plate A, whereby the several bell crank levers K, K', K² and K³, are actuated successively to actuate the plungers of the quadruplex pump C. It is understood that the inward movement of each cross head causes a forward stroke of the plunger in the respective cylinder in the direction of the arrow a', while an outward sliding of the cross head causes a return stroke of the plunger, and as two oppositely arranged bell crank levers are connected with each other, one of the plungers connected with such a bell crank lever moves outward, while the corresponding opposite one moves inward and vice versa. Thus the several plungers of the quadruplex pump C are actuated successively, and each one with the full power imparted to the shaft H by the motor used.

I do not limit myself to the number of pumps, as it will be readily understood that any desired number of pumps can be actuated in the manner described, the number of guideways, cross heads and bell crank levers,

being the same in number, and connected with the plungers of the several pumps, as above described.

It is understood that with the improvement
5 described and shown, I am enabled to move a greater volume of water than with any other pump gear known to me, and the work is performed with an immense saving of power, as
10 each of the four pumps receives in its turn the full benefit of all the indicated horse power.

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

15 1. The combination with a series of guideways radiating from a common center, cross heads sliding in said guideways and an operating mechanism, of the transmitting bell-crank levers pivoted at their angles with their
20 axes at right angles to said guideways and with the ends of their long arms engaging the said cross heads, the short arms of said levers being adapted for connection with the
25 pistons to be operated, substantially as set forth.

2. The combination with a series of guide-

ways radiating from a common center, cross heads sliding in said guideways and means for reciprocating said cross heads, of a circularly arranged series of bell crank levers pivoted at their angles with their axes at right angles to the guideways and connected in pairs, the long arms of the said levers being connected with the cross heads and their short arms being adapted for connection with the
35 pistons to be operated, substantially as set forth.

3. The combination with a circularly arranged series of bell crank levers connected in pairs, a series of cross heads reciprocating
40 at right angles to the axes of said levers and connected with the long arms thereof, of a wheel parallel with the series of slideways with its axis in line with the center of the series and having a crank pin on its inner
45 side, and a wheel on said pin and engaging the cross heads with its periphery, substantially as set forth.

STANLEY L. FULFORD.

Witnesses:

I. H. PRESTON,

A. W. FRANCISCO, Jr.