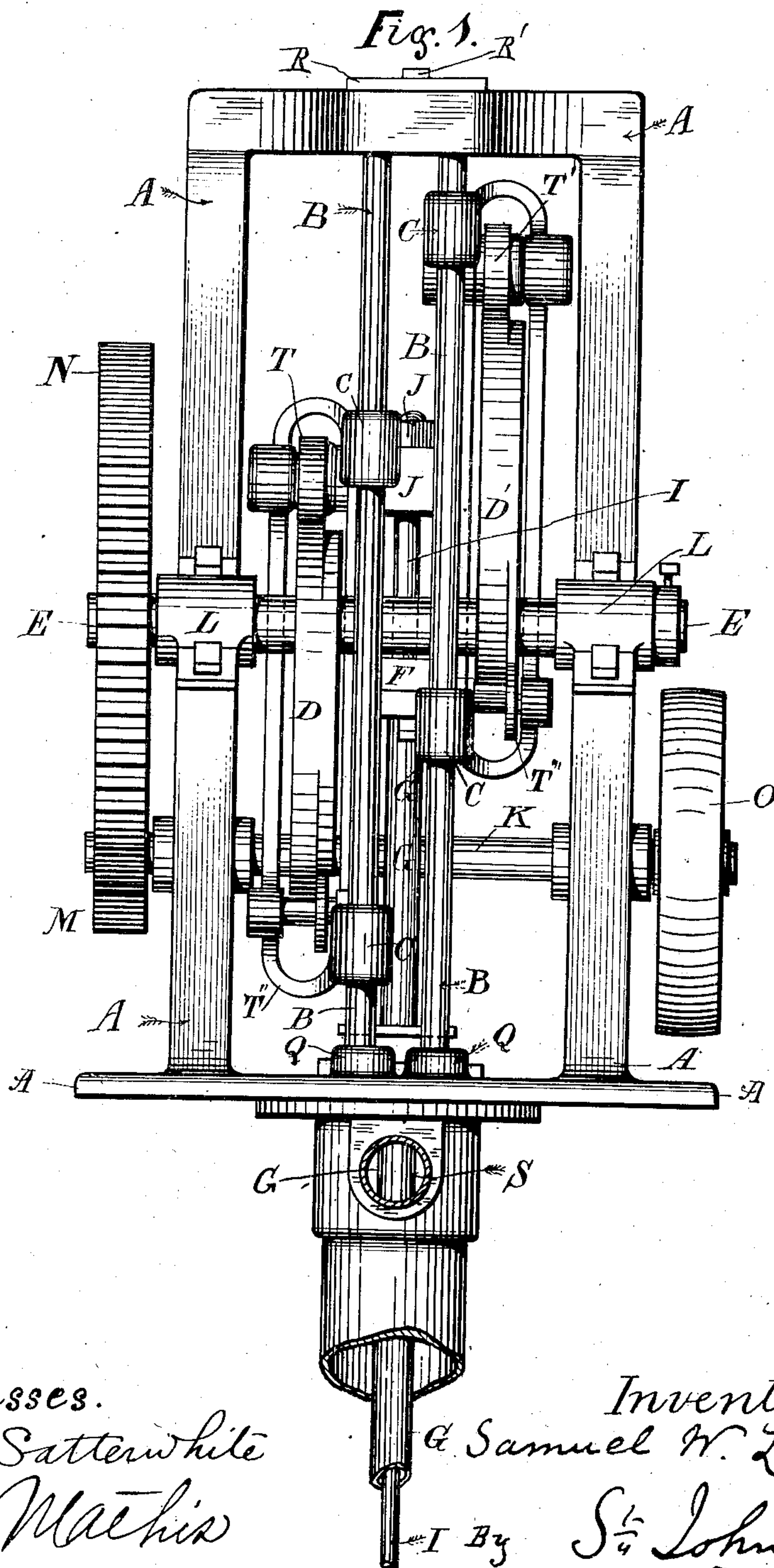


No. 819,295.

PATENTED MAY 1, 1906.

S. W. LUITWIELER.  
PUMP MECHANISM.  
APPLICATION FILED DEC. 5, 1908.

4 SHEETS—SHEET 1



Witnesses.  
John Satterwhite  
E. A. Mathis

Inventor:  
S. W. Luitwiler  
By *S. L. John Day*  
Attorney.

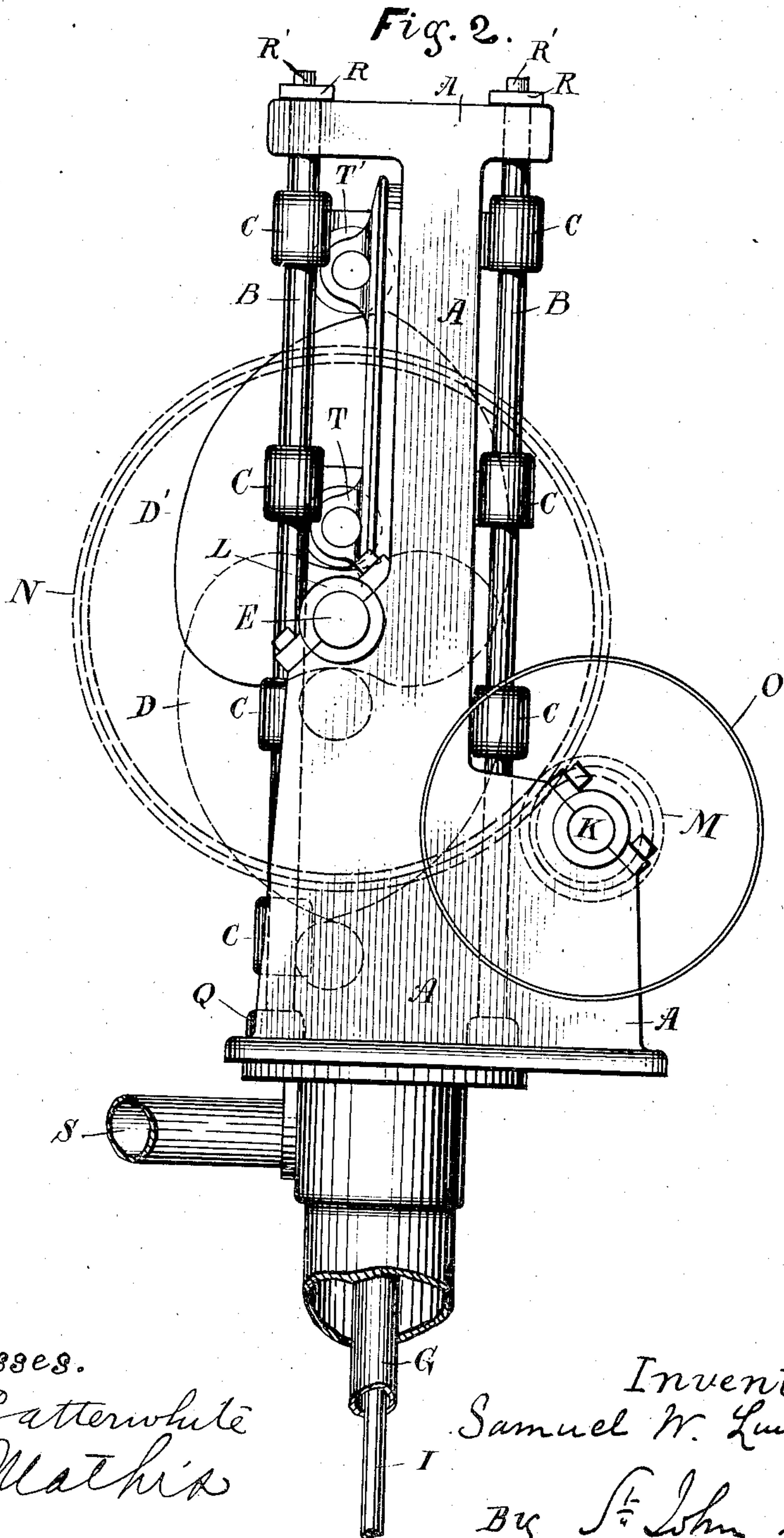
No. 819,295.

PATENTED MAY 1, 1906

S. W. LUITWIELER.  
PUMP MECHANISM.

APPLICATION FILED DEC. 5, 1898.

4 SHEETS—SHEET 2.



Witnesses.

John Satterwhite  
E. A. Mathis

Inventor:

Samuel W. Luitwieler

By S<sup>r</sup> John Day.

Attorney.

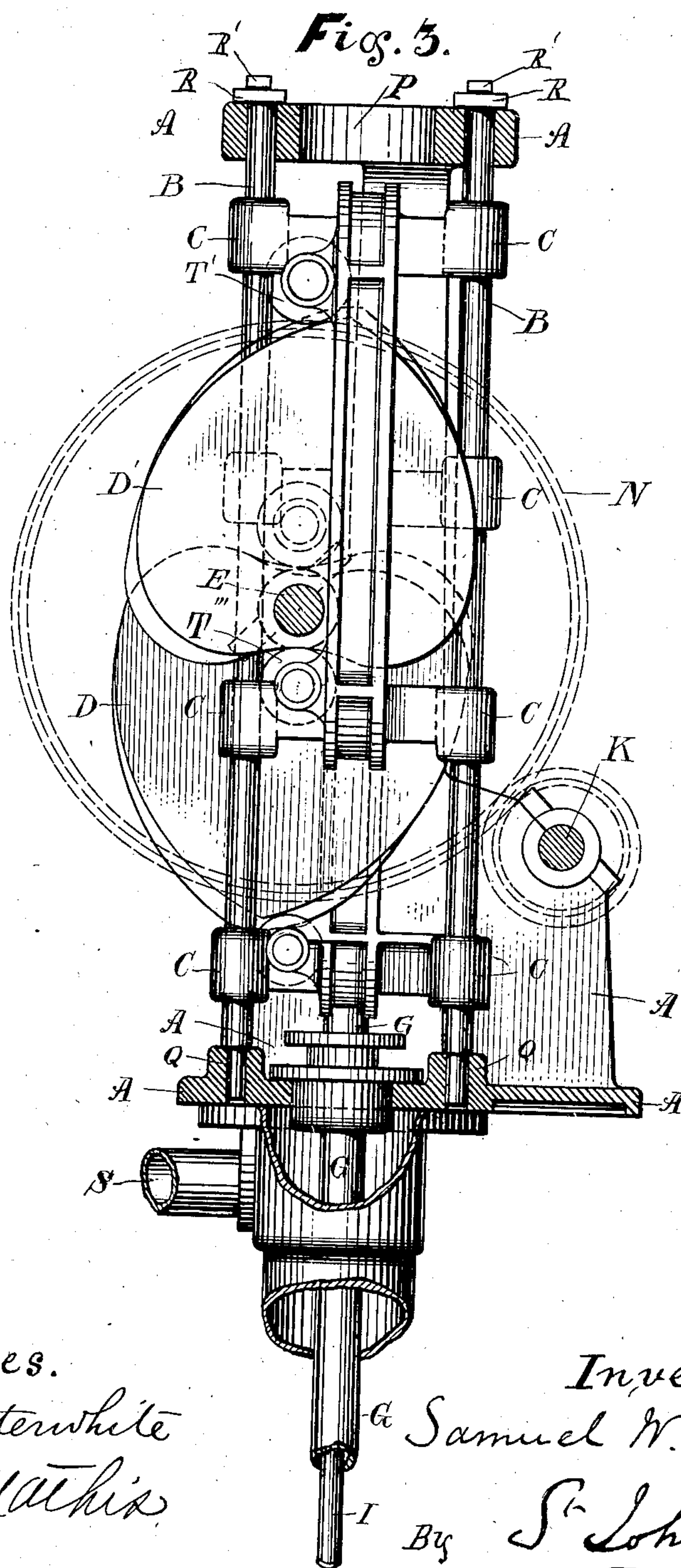
No. 819,295.

PATENTED MAY 1, 1906

S. W. LUITWIELER.  
PUMP MECHANISM.

APPLICATION FILED DEC. 5, 1898.

4 SHEETS—SHEET 3.



Witnesses.  
John Satterwhite  
E. A. Mathis

Inventor.  
Samuel W. Luitwieler  
By St. John Day.

Attorneys.



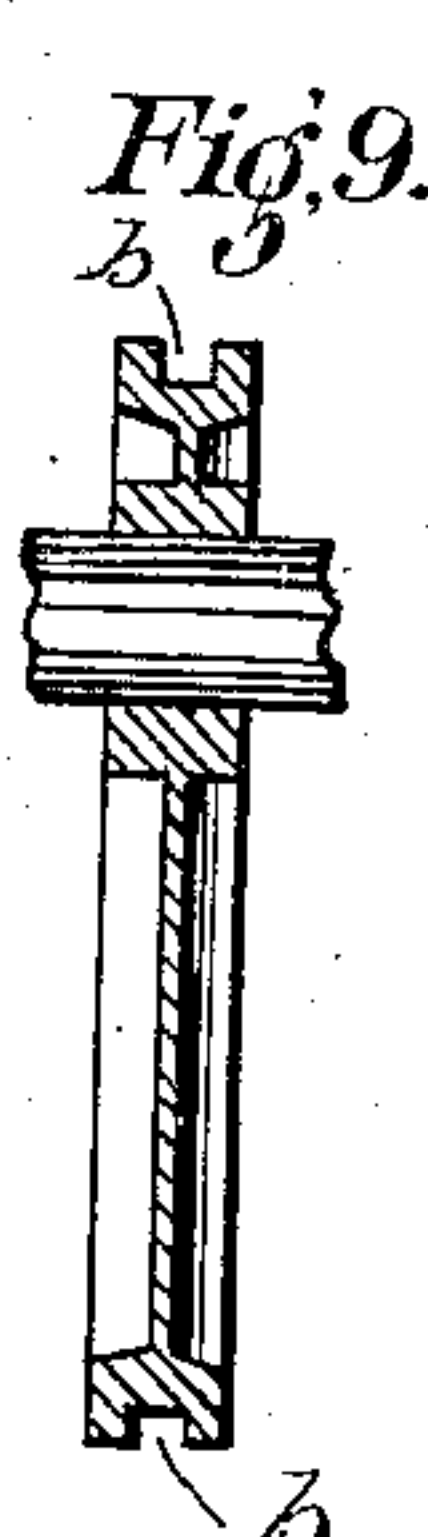
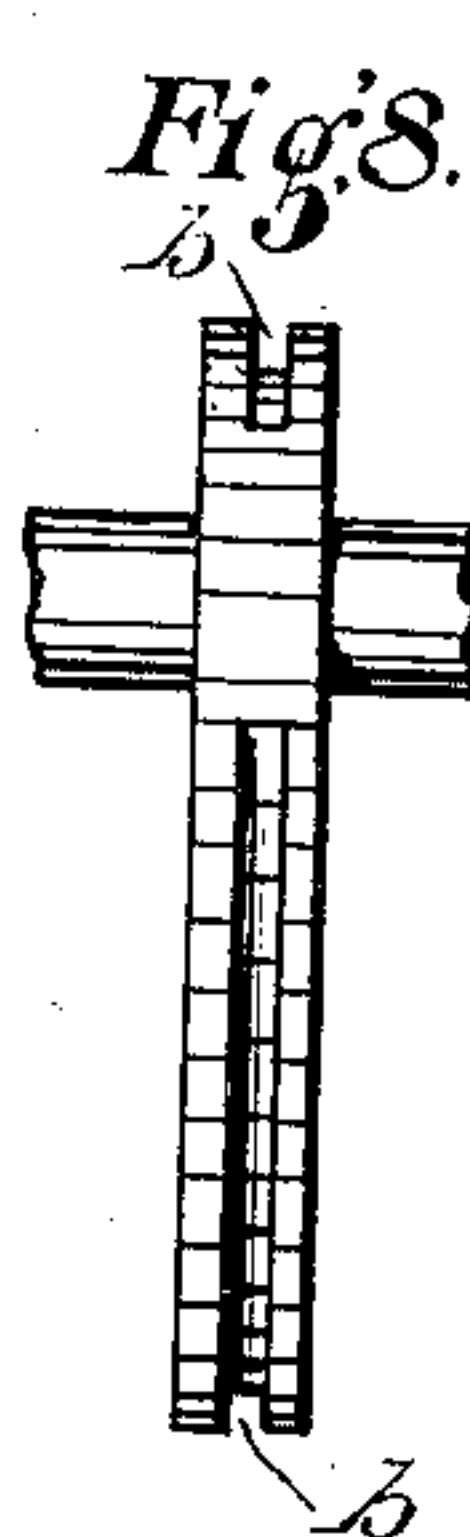
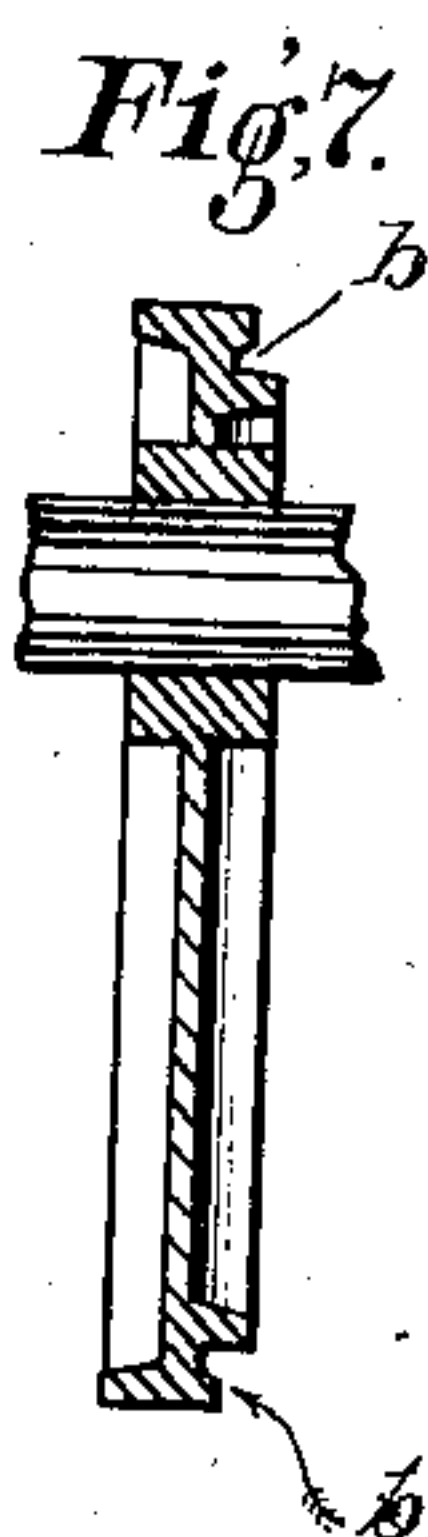
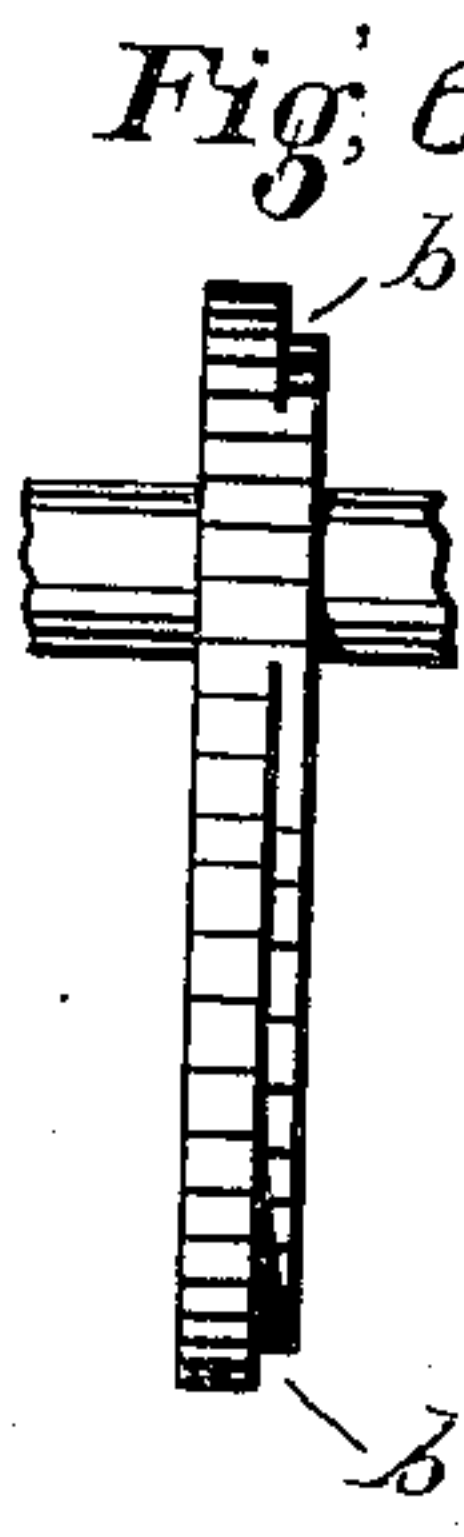
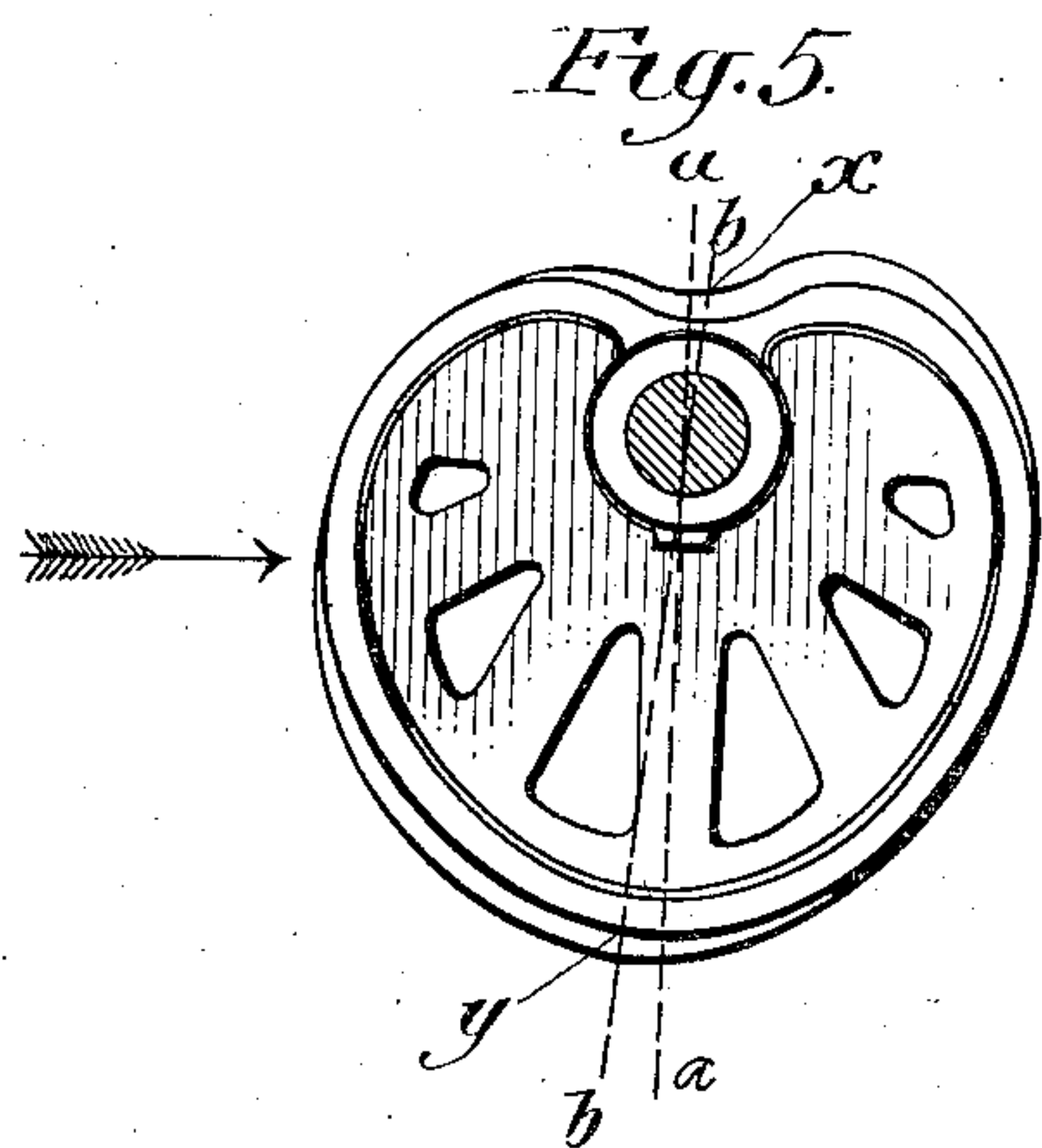
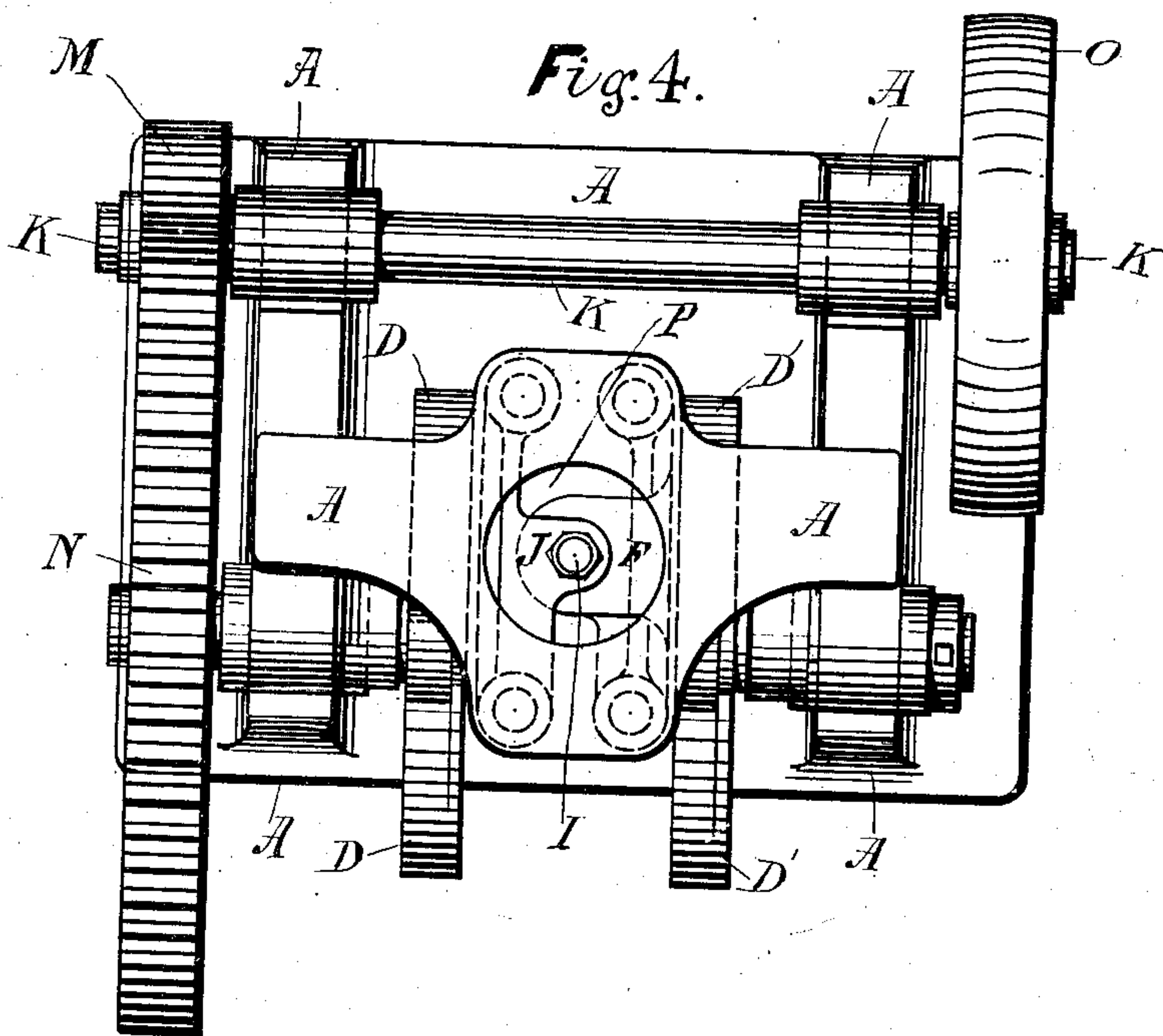
No. 819,295.

PATENTED MAY 1, 1906.

S. W. LUITWIELER.  
PUMP MECHANISM.

APPLICATION FILED DEC. 5, 1898.

4 SHEETS—SHEET 4.



Witnesses  
John Satterwhite  
E. A. Mathis

Inventor.  
Samuel W. Luitwiler

By St. John Day.

Attorney.



# UNITED STATES PATENT OFFICE.

SAMUEL W. LUITWIELER, OF LOS ANGELES, CALIFORNIA.

## PUMP MECHANISM.

No. 819,295.

Specification of Letters Patent.

Patented May 1, 1906.

Application filed December 5, 1898. Serial No. 698,358.

*To all whom it may concern:*

Be it known that I, SAMUEL W. LUITWIELER, of the city of Los Angeles, in the county of Los Angeles and State of California, have invented certain new and useful Improvements in Mechanism for Operating the Plungers of Duplex Pumps—that is to say, pumps in which two buckets or plungers are used in the same pump barrel or cylinder, one operating above the other and each connected to a separate pump-rod, the pump-rod of the upper bucket or piston being tubular and the pump-rod of the lower bucket or piston being passed and operating through the tubular rod of the upper bucket or piston, the tubular pump-rod passing through a gland and stuffing-box in the upper part of the pump and the pump-rod of the lower bucket or plunger passing through a gland and stuffing-box in the upper part of the tubular pump-rod—of which the following is a specification.

The upper ends of the two pump-rods are respectively connected each to one of two cam-frames. The tubular pump-rod is connected to the lower part of its cam-frame by being passed into an offset projecting laterally from one side of the cam-frame, and the rod of the lower plunger, which operates as aforesaid through the tubular rod of the upper plunger, is attached to an offset projecting from the upper part of the other cam-frame. Thus there is a separate cam-frame for each pump-rod.

The two cam-frames in respect to the arrangement of their several parts and the directions in which their several parts are situated are each the opposite of the other—that is to say, the several parts which are operated upon by the cams hereinafter described project in opposite directions, the object of which arrangement is to enable the offsets hereinbefore referred to to be made as short as possible and to bring the operating mechanism as closely together as possible.

The cam-frames are constructed with slide-blocks which operate upon vertical slide-bars carried in the main framing of the pumping machinery, and the cam-frames are also constructed with bearings for antifriction-rollers, upon which the driving-cams operate both in the upward and during the downward stroke of the pump. These driving-cams are carried upon a cam-shaft which rotates transversely to the main framing, and it is oper-

ated by means of a pinion in gear with a toothed wheel upon one end of the shaft. The toothed pinion is carried upon a countershaft, at the other end of which is a belt-driving pulley. Two vertical slide-bars are carried in the main framing for each cam-frame to be moved upward and downward upon by the rotation of the cams.

On the annexed sheets of drawings, Figure 1 is a front elevation of my new or improved mechanism for operating pump-rods and buckets of double-plunger pumps of the kind hereinbefore referred to. Fig. 2 is a side elevation of the same. Fig. 3 is a transverse section of certain parts of the said pump mechanism with parts shown in side elevation. Fig. 4 is a plan of my improved pump mechanism corresponding to Figs. 1, 2, and 3. Fig. 5 is a side elevation of one of the cams used for operating the cam-frames; shown separately. Fig. 6 is an edge elevation of Fig. 5. Fig. 7 is a vertical section of the said cam upon line *a a*, Fig. 5. Fig. 8 is an edge elevation of the said cam with a depressed recess or groove situated at the center in place of at the side, as shown in Figs. 5 and 6. Fig. 9 is a transverse section of the cam as shown in Fig. 8.

In the drawings the pump-frame is marked *A A*, and there are situated vertically in this framing four slide-bars *B B B B*, each of which constitutes a member of a pair, upon which the slide-blocks *C C* of each cam-frame move slidingly upward and downward as the cam-frame is alternately raised and lowered by the rotating action of the cams *D* and *D'*, carried upon the cam-shaft *E*. Each pair of slide-bars *B B* maintains a steady vertical motion of the cam-frames, whereby the movement of the pump-rods is always maintained parallel with their vertical axis and all lateral strains tending to bend the pump-rods are got rid of. One of the cam-frames—namely, that one situated at the right-hand side of Fig. 1—has an offset *F* projecting from its inner side, and into a hole in this offset the upper end of the tubular piston-rod *G* is fastened, so that the cam *D'* operates the upper piston or bucket, to which the tubular piston-rod *G* is attached by being connected to the offset *F* at the lower end of the right-hand cam-frame. In the upper part of the offset *F* a stuffing-box is constructed, and the gland *H* tightens the packing in the said stuffing-box, so that the inner pumping-rod *I* may be operated by the left-hand cam-frame. (Shown



at the left-hand side of Fig. 1 of the drawings.) The pump-rod I is connected to the offset J, projecting inwardly from the upper part of the left-hand cam-frame and fastened there-  
 5 to by a nut J', as shown at Figs. 1 and 4. In the lower part and at the rear of the main framing A there is carried a counter-shaft K, situated in bearings analogous to the bearings L in which the cam-shaft E is situated. This  
 10 counter-shaft K carries a spur-pinion M, which gears into the spur-wheel N, and at the opposite end of this counter-shaft K a belt-pulley O is situated, so that a driving-belt operating upon the pulley O drives the whole  
 15 of the pump mechanism.

For the purpose of facilitating the putting together and taking asunder of the parts of the pump and for removing the pistons and piston-rods without taking apart the pump-  
 20 driving gear the upper part of the framing A is formed with a circular hole P at its center, up through which the pump rods and pistons can be lifted. The slide-bars B B B B enter sockets Q Q at the lower end of the main  
 25 framing A and are kept in their places in the frame by means of plates R, which are held to the frame by means of the stud-bolts R', as shown at Figs. 1, 2, and 3.

The water raised by the pumps is dis-  
 30 charged from the pump-head by the pipe S.

The cams D and D' are of duplex construction—that is to say, they contain two driving-surfaces, the broader one of which presses against the upper antifriction-rollers T and  
 35 T' during the upward throw of the cams D and D' and the narrower one of which presses against the lower antifriction-rollers T'' and T''' during the downward throw of the said cams D and D'. The formation of the driv-  
 40 ing-surface of the cam will be better understood by reference to Figs. 5, 6, and 7, and in place of the recess b being made at one side, as shown in Figs. 5, 6, and 7, this recess b may be made in the center of the width of the cam-  
 45 as shown in Figs. 8 and 9.

Having now described the nature of my said invention and the best system, mode, or manner I am at present acquainted with for carrying the same into practical effect, I de-  
 50 sire 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 framing consisting of the base, two vertical side members, 55 and the top member, the base being that from which the pump is suspended and wherein the lower ends of the slide-bars are carried, the sides constituting and containing the bearings for the driving-shaft and cam- 60 shaft, the upper member of the framing constituting and containing the sockets through and by which the slide-bars are passed and held, having also a center opening for the lowering and raising of the pump rods and 65 plungers, the vertical slide-bars, the driving-shaft, the cam-shaft, the cams on said shaft, the spur-pinion and spur-wheel for operating the cam-shaft, the cam-frames with their alternately-arranged offsets, the antifriction- 70 rollers in said cam-frames, the pump-rods, the pump, the whole constituting an improved double-plunger pump and operating substantially as hereinbefore described and shown upon the annexed drawings.

2. The herein-described combination of the framing consisting of the base, two vertical side members, and the top member, the base being that from which the pump is sus- 80 pended, the sides constituting and containing the bearings for the driving-shaft and the cam-shaft, said top member having a center opening for the lowering and raising of the pump rods and plungers through, the vertical slide- 85 bars, means for carrying and supporting the slide-bars, the driving-shaft, the cam-shaft, the cams on said shaft, the spur-pinion and spur-wheel for operating the cam-shaft, the cam-frames with their alternately-arranged 90 offsets, the antifriction-rollers in said cam-frames, the pump-rods, the pump, the whole constituting an improved double-plunger pump operating substantially as hereinbefore described.

In testimony whereof I have hereunto set 95 my hand in the presence of two subscribing witnesses.

SAMUEL W. LUITWIELER.

Witnesses:

ST. JOHN DAY,  
 JOHN SATTERWHITE.