

(No Model.)

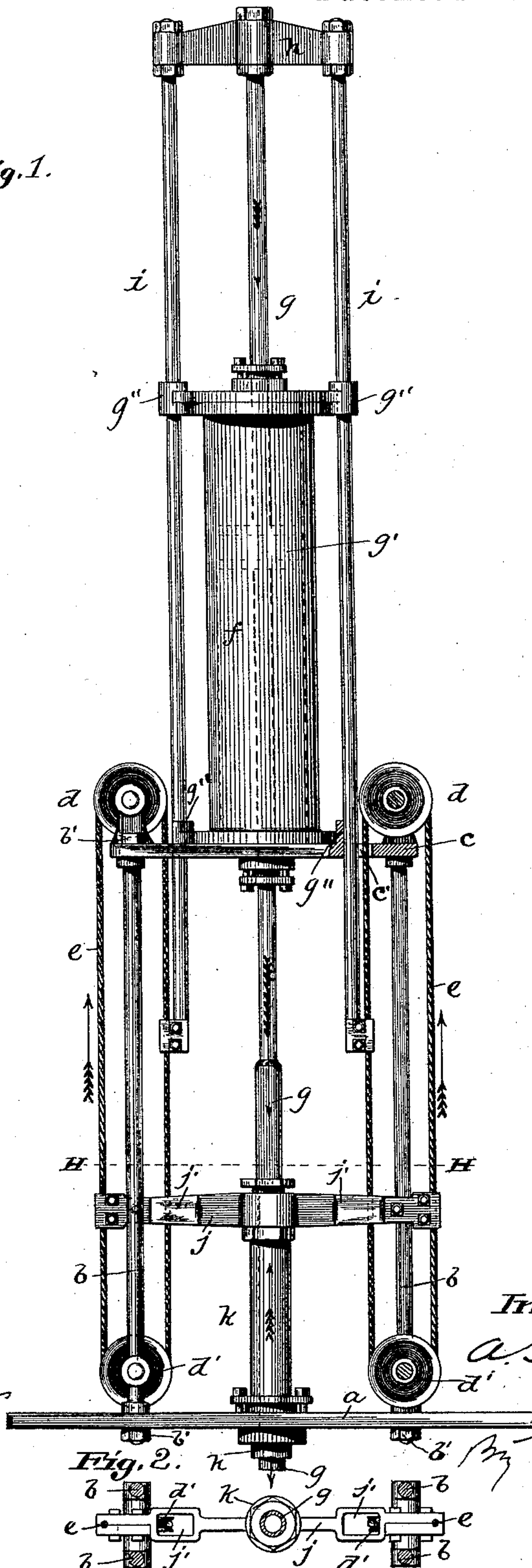
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A. F. COOK.
DEEP WELL PUMP.

No. 421,247.

Patented Feb. 11, 1890.

Fig. 1.



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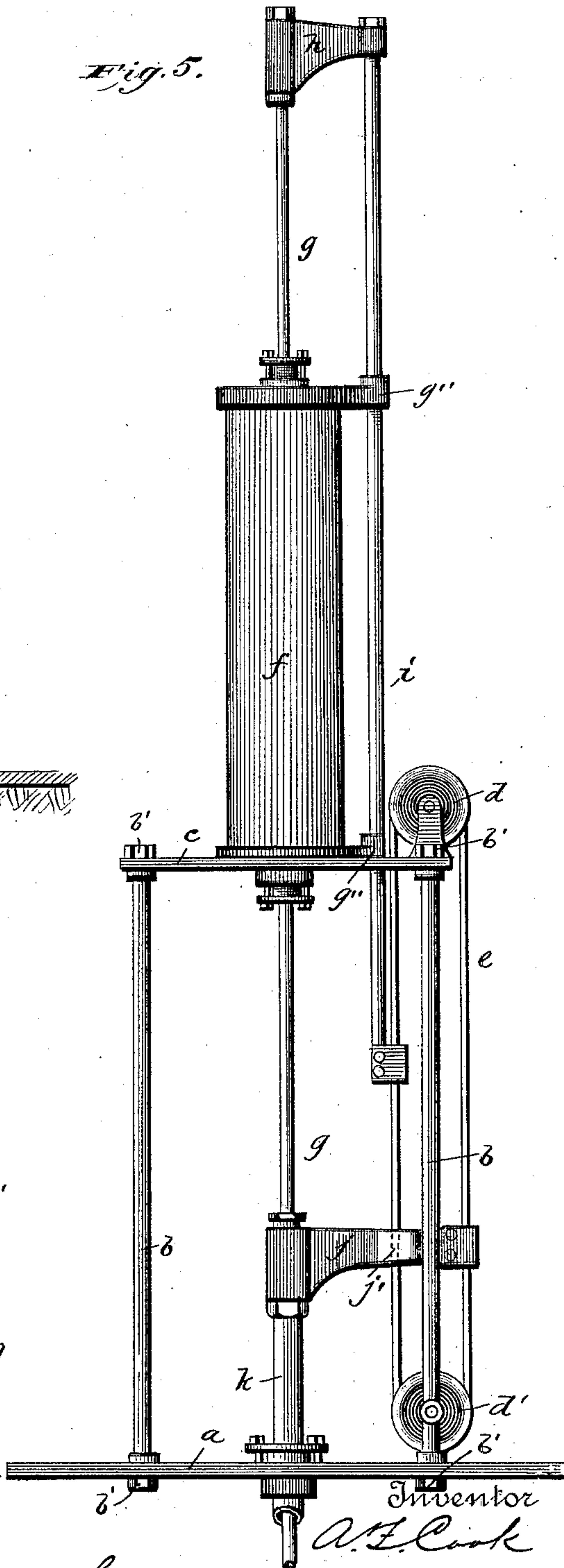
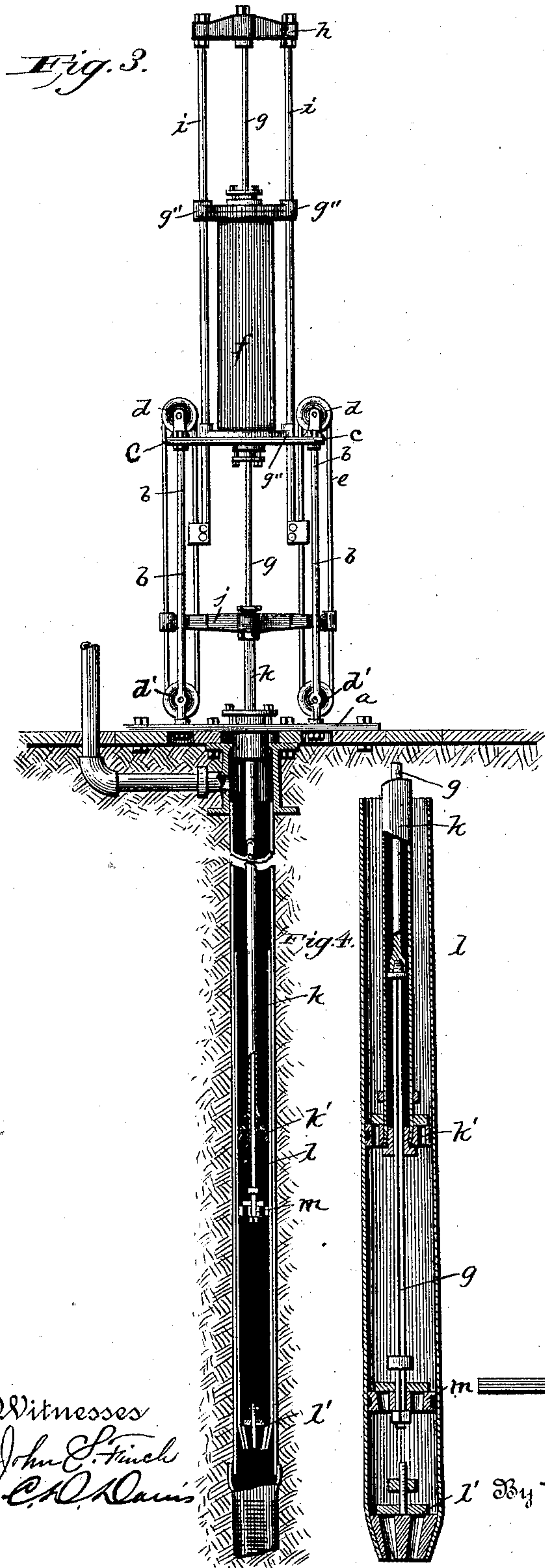
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Witnesses
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UNITED STATES PATENT OFFICE.

ALFRED F. COOK, OF ST. LOUIS, MISSOURI.

DEEP-WELL PUMP.

SPECIFICATION forming part of Letters Patent No. 421,247, dated February 11, 1890.

Application filed August 1, 1889. Serial No. 319,454. (No model.)

To all whom it may concern:

Be it known that I, ALFRED F. COOK, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Deep-Well Pumping-Engines, of which the following is a specification, reference being had therein to the accompanying drawings, in which—

Figure 1 represents a side elevation of the pump-operating mechanism; Fig. 2, a transverse sectional view on the line H H of Fig. 1; Fig. 3, a view, partly in section and partly in side elevation, of the pump complete; Fig. 4, a sectional view of the pump-cylinder with its pistons, and Fig. 5 a view showing a slight modification of the pump-operating mechanism.

In the accompanying drawings, *a* designates the base-plate of the pump, which plate is suitably secured to the platform of the well. Erected upon the base-plate is a frame composed of the four upright bars *b* and the platform *c*, the ends of the said bars being secured to the base-plate and platform by means of nuts *b'*, tapped on the bars. Journaled in suitable bearings upon the platform *c* are two grooved pulleys *d*, and between the supporting-rods *b*, near the base-plate and in line with the upper pulleys, are two similar pulleys *d'*. Connecting the respective pairs of pulleys are endless cables or chains *e*, the inner portions of the cables passing through apertures *c'* in the platform *c*. Mounted and suitably bolted upon the center of the platform *c*, between the two pulleys *d*, is a vertical cylinder *f*, provided with suitable stuffing-boxes in its heads for the passage of the piston or pump rod *g*, this piston-rod being provided with a suitable piston *g'* within the cylinder. Attached to the upper end of the piston-rod is a cross head or arm *h*, secured to the ends of which are two depending connecting-rods *i*, these rods being guided in their movements by the ears *g''*, cast upon the cylinder-heads. These rods are further guided by being passed through the holes *c'* in the platform. The lower ends of the rods *i* are attached by means of clamps to the inner portions of the respective endless cables *e*, whereby the said cables are moved in unison. Connecting the outer portions of the

cables is a cross-bar *j*, which is provided with apertures *j'* for the passage of the inner portions of the cables and the reciprocatory rods *i*. This cross-head *j* has secured to its center a tubular pump-rod *k*, which passes down through a stuffing-box in the base-plate, and is provided at its lower end with a valved piston or plunger *k'*, which works in the pump-cylinder *l*.

The pump-cylinder is suitably secured within the well-tube, and is provided with the usual check-valve *l'* at its lower end.

The piston-rod *g* passes down centrally through the tubular pump-rod and its piston, and is provided with a valved plunger *m* at its lower end. That portion of the rod *g* which passes through and works in the plunger *k'* is formed rectangular in cross-section to prevent the plungers and their rods turning independently of each other, whereby accidental unscrewing of the sections of the pump-rods is prevented and obviated.

In the device shown in Fig. 5 I show that only one of the endless cables may be employed without departing from the invention.

The cylinder *f* is provided with any suitable valve-chest and valve mechanism whereby to admit the motive fluid, which may be steam, air, water, or other fluid.

When motion is imparted to the piston in the cylinder *f*, the pump-rod *g* and its plunger will be reciprocated in a corresponding direction, while the tubular rod *k* and its plunger will, through the medium of the rods *i* and endless cables, be simultaneously moved in the reverse direction. By thus operating the plungers of the pump in opposite directions a steady and continuous supply of water will be obtained.

By the arrangement of devices shown and described the pistons will be operated with a minimum of friction and wear and jar.

The invention is designed particularly for deep-well pumping; and its essential feature consists in operating the oppositely-movable pistons simultaneously with a vertical steam-cylinder mounted directly over the well and connected directly with the main piston of the pump.

Having thus fully described my invention, what I claim is—

The combination of a frame, a cylinder *f*,

mounted upon this frame, a piston working
in this cylinder, a piston-rod *g*, connected to
this piston and passing through both heads
of the cylinder, the lower end of this rod *g*
5 being provided with a valved plunger, a
pump-cylinder for this piston to work in, a
tubular pump-rod *k*, surrounding the rod *g*
and provided at its lower end with a valved
plunger and at its upper end with an arm *j*,
10 a downwardly-extending rod or rods *i*, con-

nected to the upper end of rod *g*, and an end-
less cable or cables connecting the rod *i* to the
arm of the rod *g*, substantially as described.

In testimony whereof I affix my signature in
presence of two witnesses.

ALFRED F. COOK.

Witnesses:

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