(No Model.) 2 Sheets—Sheet 1.

# H. F. GASKILL.

## STEAM AND HYDRAULIC PUMPING ENGINE.

No. 291,892. Patented Jan. 15, 1884.

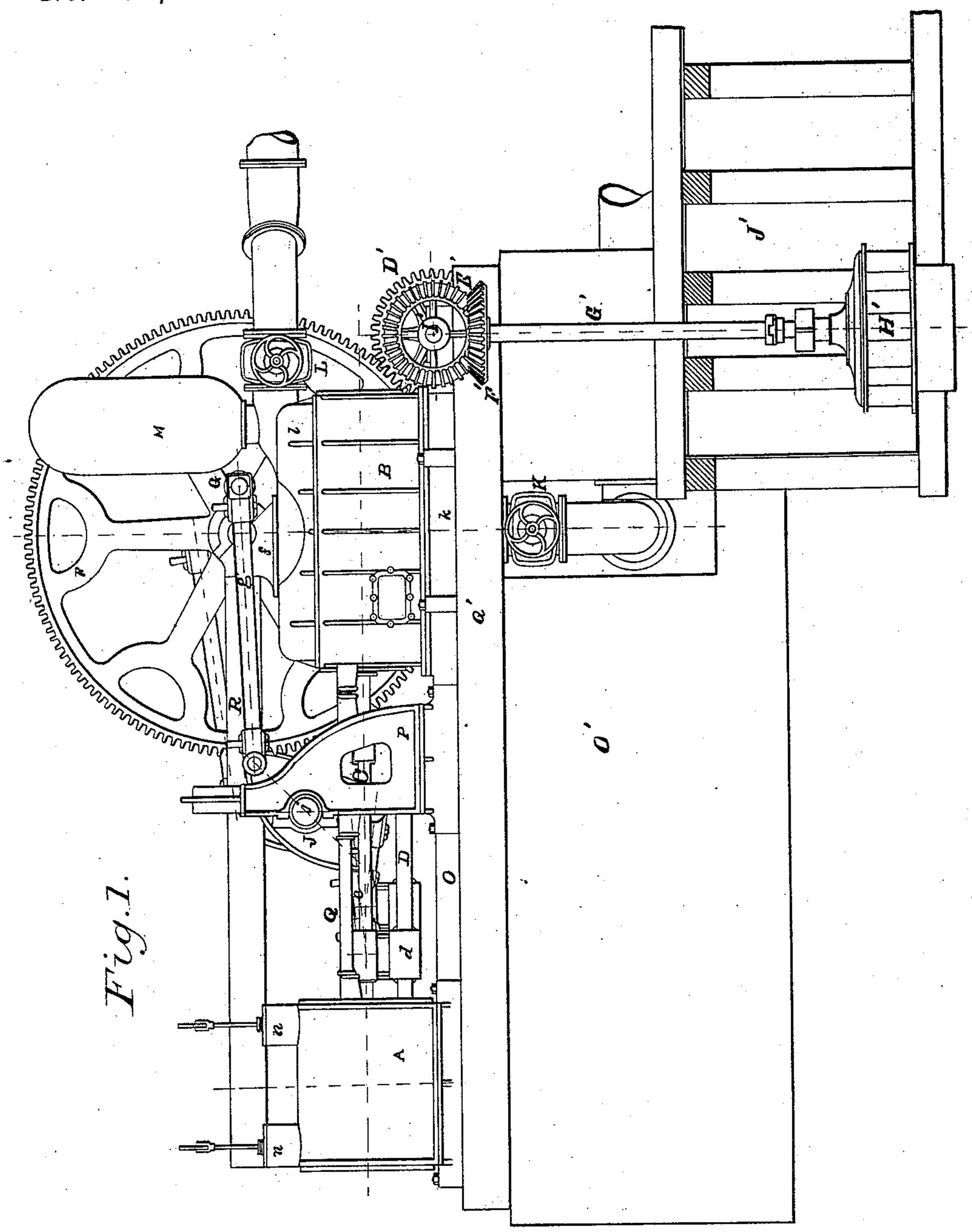

Fig. 1.

Witnesses
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(No Model.) 2 Sheets—Sheet 2.

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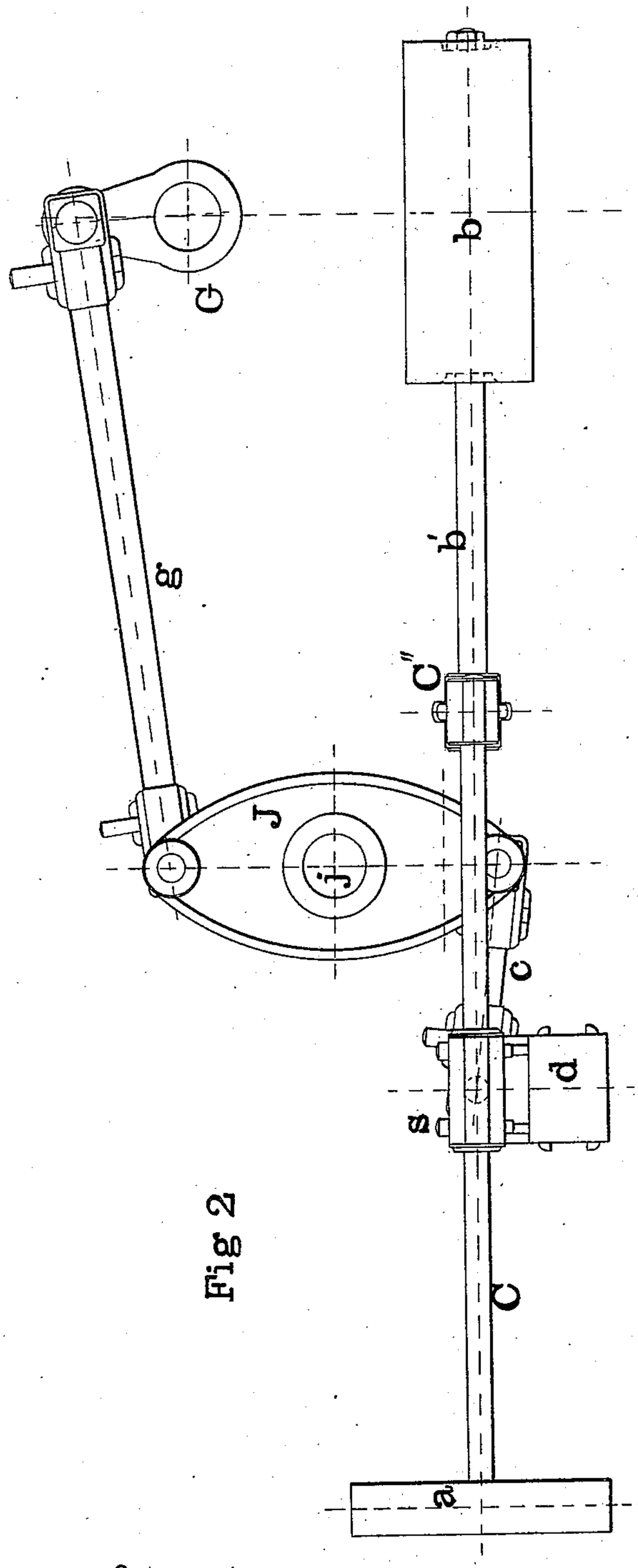


Fig 2

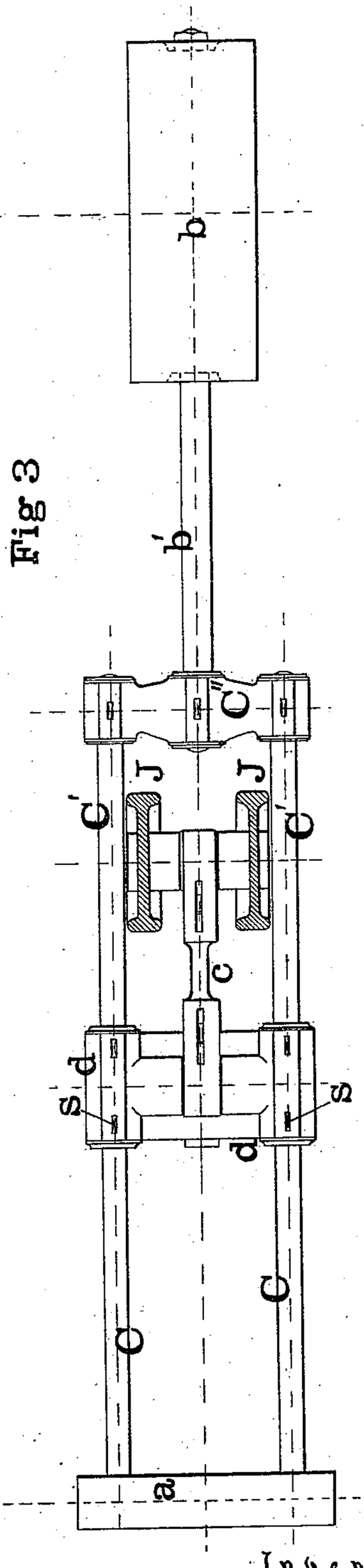


Fig 3

Attest
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# UNITED STATES PATENT OFFICE.

HARVEY F. GASKILL, OF LOCKPORT, NEW YORK.

## STEAM AND HYDRAULIC PUMPING-ENGINE.

SPECIFICATION forming part of Letters Patent No. 291,892, dated January 15, 1884.

Application filed December 26, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, HARVEY F. GASKILL, of Lockport, Niagara county, New York, have invented certain Improvements in Steam and Hydraulic Pumping-Engines, of which the following is a specification.

This invention relates more especially to pumping-engines designed for places in which there is a moderate water-power, and in which it is sometimes necessary to supplement the water-power with steam; and its object is to provide a simple and cheap machine which can be used with water-power alone, or with steam-power alone, or with steam and water power combined. To this end I employ certain features of construction shown in the patent granted me September 5, 1882, No. 263,694, and certain other features not shown in that patent but described hereinafter, the improvements claimed herein being a part of the same invention to which that patent pertains.

The principal elements entering into the combinations which constitute my invention are the following, viz: One or more pumps and their fittings; one or more steam-cylinders in line with the pumps; a crank-shaft set above the pumps and mounted in bearings on them; a gear-wheel, which also acts as a fly-wheel, on the crank-shaft; a beam connected to the pump and piston-rod and also to the crank-shaft; a pinion meshing with the gear; a water-motor acting upon the pinion-shaft.

In practice thus far I have preferred to build the engine on the duplex principle—that is to say, having two pumps placed side by side, and having the gear and fly wheel between them, and having a steam-cylinder in line with each pump, and the cranks set at right angles with each other. I have also preferred to have the gear-wheel of such proportions that it alone will be a sufficient fly-wheel.

The drawings show a machine of this character.

Figure 1 is a side elevation of the machine. Fig. 2 is an elevation showing the steam-piston, the pump-plunger, the crank-shaft, and the operative connections in their relative positions. Fig. 3 is a plan showing the steam-piston, the pump-plunger, and the operative connections, the beam being in section.

In the drawings, O′ Q′ is a foundation, generally of masonry. O is the base-casting of the engine-frame. B is a pump; *f*, a pillow-block or bearing for the crank-shaft G, located on the pump; F, the gear fly-wheel between the two pumps; D′, a pinion; I′, the pinion-shaft, having its bearings on a backward extension of the base-casting O. H′ is a turbine wheel. E′ F′ are bevel-gears, through which power from the water-wheel is transmitted to the pinion-shaft I′, whence it is transmitted through the pinion and gear wheel to the crank-shaft G. P is a standard, which supports bearings for the beam-shaft *j*. J is a beam; *g*, a connecting-rod between upper end of beam and crank. There are two of these beams—one between each pump and its crank. A is a steam-cylinder in line with the pump. *a* is the steam-piston. *b* is the pump-plunger. C is a double piston-rod, connecting the piston *a* with cross-head *d*. *b′* is the pump-rod. C′ are rods, and C″ a cross-head, connecting the pump-rod *b′* with cross-head *d*. *d* is a cross-head on the pump and piston-rod. D is a guide for the cross-head. *c* is a link connecting the cross-head with the lower end of the beam. Q and R are strut-ties connecting the steam-cylinder, the standard P, the pump, and the main bearing *f*.

When desired, the steam-cylinder may be disconnected, and the pumps run by water-power alone, or the water-motor may be disconnected and the pumps run by steam-power. An additional steam-cylinder may be placed on each of the cylinders A and connected therewith, as in a compound engine. In this case the additional cylinders may operate on the upper ends of the beams. When thus constructed, the steam machinery will be like my patent of September 5, 1882.

What I claim is—

1. The combination of the pump, the steam-cylinder in line with the pump, the water-motor, the crank-shaft having a bearing on the pump, the gear and fly wheel on the crank-shaft, and the beam, substantially as described.

2. The combination of the pump, the steam-

cylinder in line with the pump, the crank-shaft having a bearing on the pump, the fly-wheel on the crank-shaft, and the beam connected to the pump and piston-rods and the crank-shaft, substantially as described.

3. The combination of the steam-motor, the water-motor, the pump, the crank-shaft having a bearing on the pump, the gear and fly wheel on the shaft, the beam, the pinion, and the pinion-shaft having a bearing on the backward extension of the frame.

HARVEY F. GASKILL.

Attest:
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