(No Model.) 2 Sheets—Sheet 1.

T. WHITAKER.

FRICTION GEARING FOR CRANES.

No. 563,344. Patented July 7, 1896.

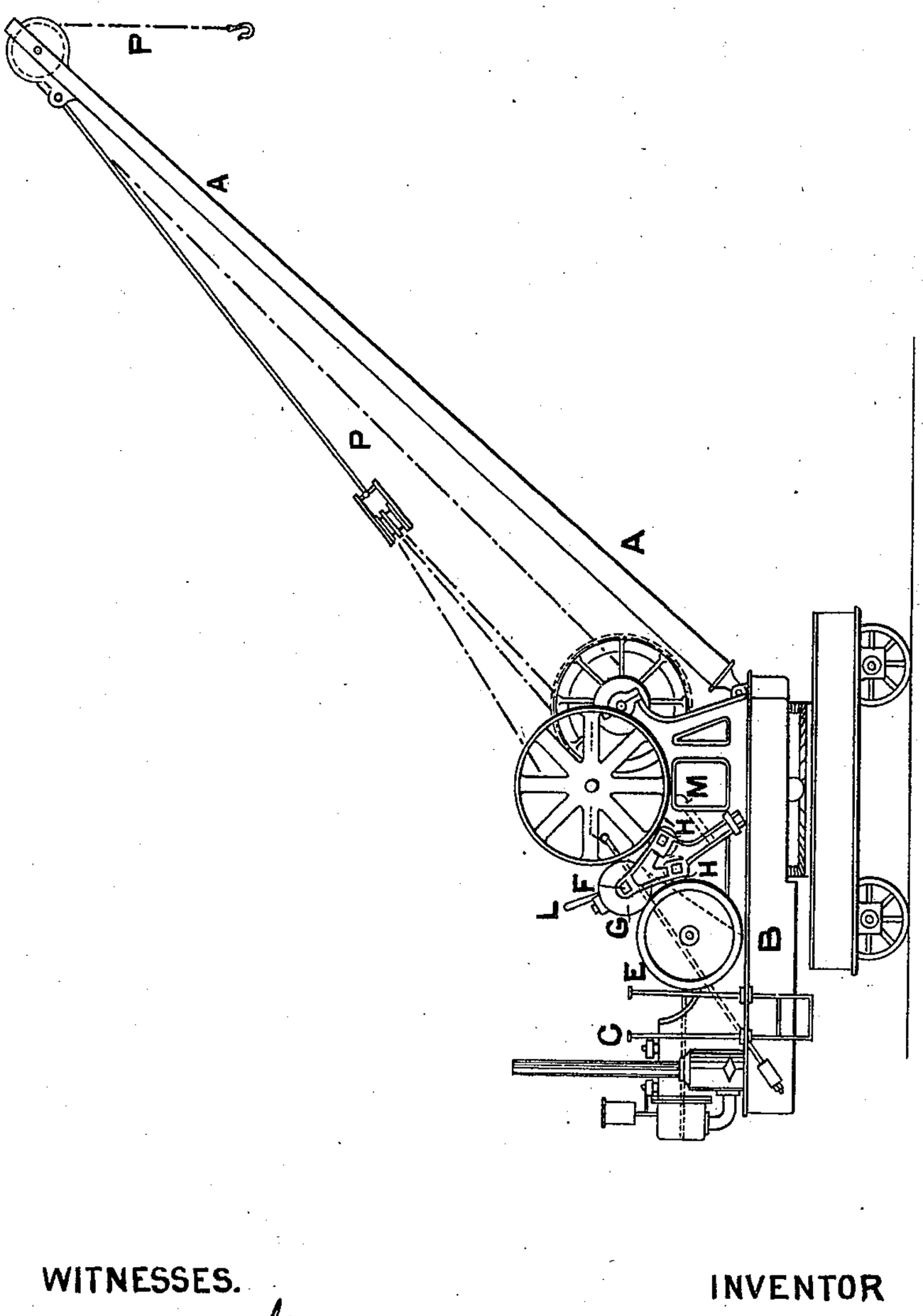

FIG. I.

WITNESSES.

Chas. Doendale

Joseph Bates.

INVENTOR

Thos. Whitaker

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attys.

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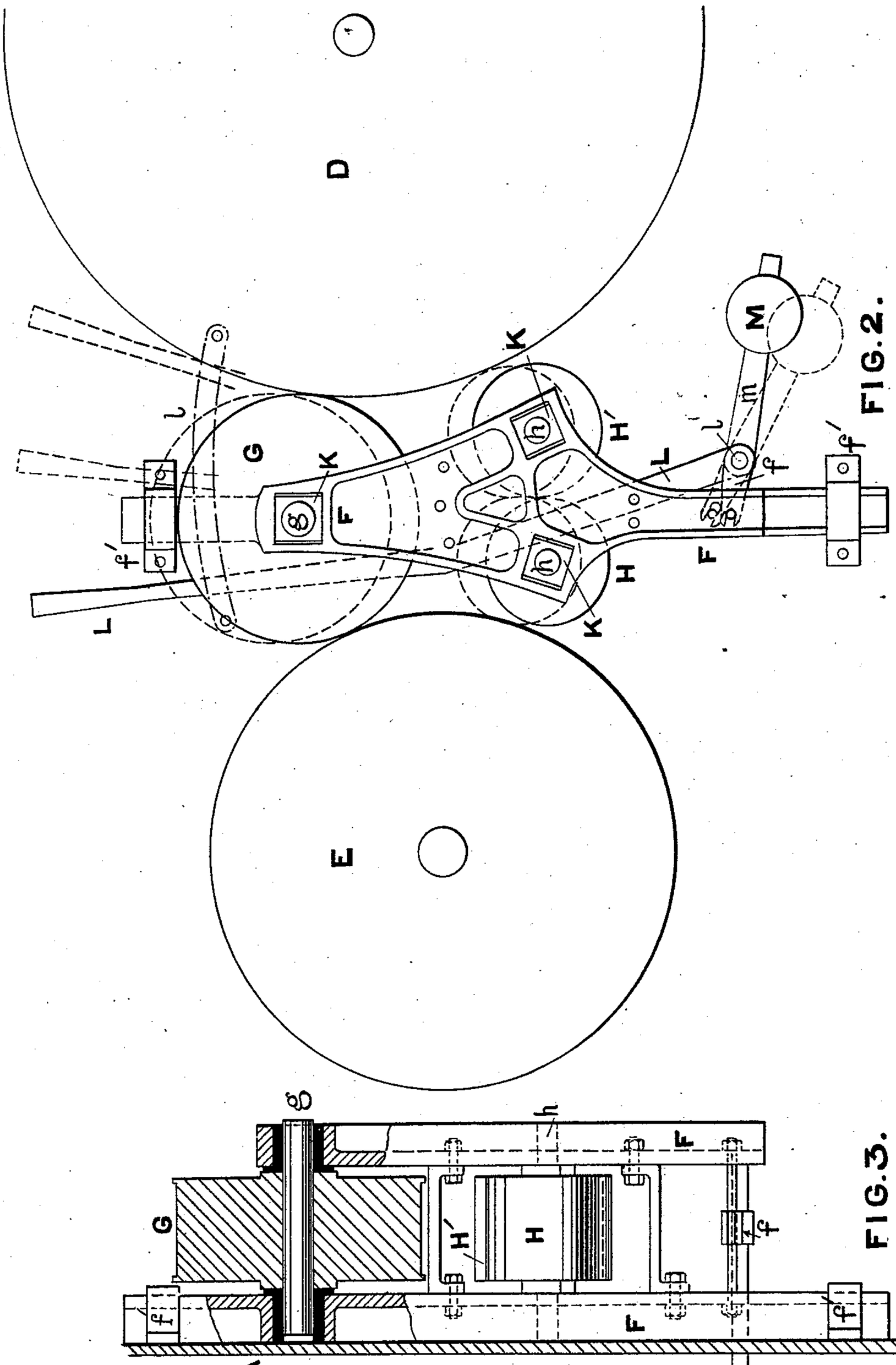

FIG. 2.

FIG. 3.

WITNESSES.

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UNITED STATES PATENT OFFICE.

THOMAS WHITAKER, OF HORSFORTH, ENGLAND.

FRICTION-GEARING FOR CRANES.

SPECIFICATION forming part of Letters Patent No. 563,344, dated July 7, 1896.

Application filed July 26, 1895. Serial No. 557,262. (No model.)

To all whom it may concern:

Be it known that I, THOMAS WHITAKER, a subject of the Queen of Great Britain, residing at Horsforth, near Leeds, in the county of York, England, have invented certain new and useful Improvements in or Relating to Friction-Gearing for Cranes, of which the following is a specification.

This invention is designed to provide friction-gear for the actuating or driving of cranes and excavating-machines, whereby an oil-engine may be employed in substitution for steam engines or cylinders in order to obviate the necessity of providing or finding sufficient water to supply the boiler and of carrying bulky fuel coal or coke for the furnace.

It consists, essentially, in the combination, with cranes and excavating-machines and an oil-engine as a driving-motor, of a movable slide or link motion carrying a number of friction wheels or pulleys placed between the fly-wheel of the oil-engine and the driving or actuating wheel of the machine.

The invention will be fully described with reference to the accompanying drawings, wherein, as an example, it is shown as applied to the working of a crane.

Figure 1 is a side elevation of crane. Fig. 2 is a side elevation, enlarged, of the operating mechanism. Fig. 3 is an end elevation of same.

The crane A is of any ordinary construction, and upon the base B, in substitution for the ordinary steam-boiler and cylinders, I place an oil-engine C of the usual type.

On the driving-shaft of the machine I place a friction-wheel D in line with the fly-wheel E of the oil-engine or a friction-wheel rotated thereby. Between the wheels D and E, I place a double frame F, carrying a number of friction-wheels G, H, and H′, which can be thrown into or out of gear or contact with the friction-wheels D and E on the oil-engine and crane, respectively.

The friction-wheels G, H, and H′ are arranged in two sets, one placed above the other, so that by moving them up and down either set may be brought into gear with both the friction-wheels D and E. I at present prefer to employ three of these friction-wheels arranged as shown, with one above and two below, to transmit movement from the wheel D to the wheel E in either forward or backward direction. The top set may consist of two wheels and the bottom set may comprise three wheels, or vice versa, one set containing one wheel more than the other. I prefer to employ flat-faced friction-wheels, as shown, but they may be of V shape or grooved or otherwise formed, if desired.

The movable friction-wheels G, H, and H′ are mounted upon studs or spindles *g* and *h*, which rotate in movable bearings K in the sliding frame F.

The frame F is capable of sliding or of being moved longitudinally between the friction-wheel D on the driving-shaft of the crane and the friction-wheel E on the oil-engine shaft, and as the frame F is moved the friction-wheels G, H, and H′ are moved with it, so that one set or other can be moved into gear with the wheels D and E.

The sliding frame F is connected by a crank-arm *f* with the pivoted handle or lever L, by which the frame is caused to slide in either direction, as required, and the lever therefore takes the place of the ordinary starting-lever. The hand-lever L moves to and fro over a quadrant *l*, similar to that employed for the ordinary starting-lever.

A balance-weight M is connected by the arm or lever *m* to the spindle *l′*, upon which the lever L is pivoted to counterbalance the weight of the sliding frame F and friction-wheels carried thereon. The sliding frame F is held in position by and slides in brackets *f′*, attached to the side of the crane.

In operating the crane or other machine the sliding frame with the friction-wheels G, H, and H′ is capable of being placed in three positions, the first in which one friction-wheel G or set of friction-wheels are in gear with the friction-wheels D and E, as shown in full lines, Fig. 2, to give the forward movement; the second position in which the second set of friction-wheels H and H′ are in gear with the friction-wheels D and E, as shown in dotted lines, Fig. 2, to give the backward movement, and the third position midway between the other two in which both sets of friction-wheels are out of contact with either of the friction-wheels D and E to bring the machine to rest.

What I claim as my invention, and desire to protect by Letters Patent, is—

The combination with friction-wheels D and E of the double frame F capable of sliding up and down, two sets of friction-wheels, G, H and H′ which gear with the wheels D and E the spindles *g* and *h* upon which the friction-wheels are mounted the movable bearings K in which the spindles rotate, the crank-arm *f* the counterbalanced lever *m* affixed to the spindle *l′* the spindle *l′* the balance-weight M on the lever *m* the hand-lever L pivoted on *l′* and the quadrant *l* all substantially as described and shown.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOMAS WHITAKER.

Witnesses:

I. OWDEN O'BRIEN,

CHAS. OVENDALE.