(No Model.)

2 Sheets—Sheet 1.

J. H. ELWARD.

TRACTION ENGINE.

No. 272,670. Patented Feb. 20, 1883.

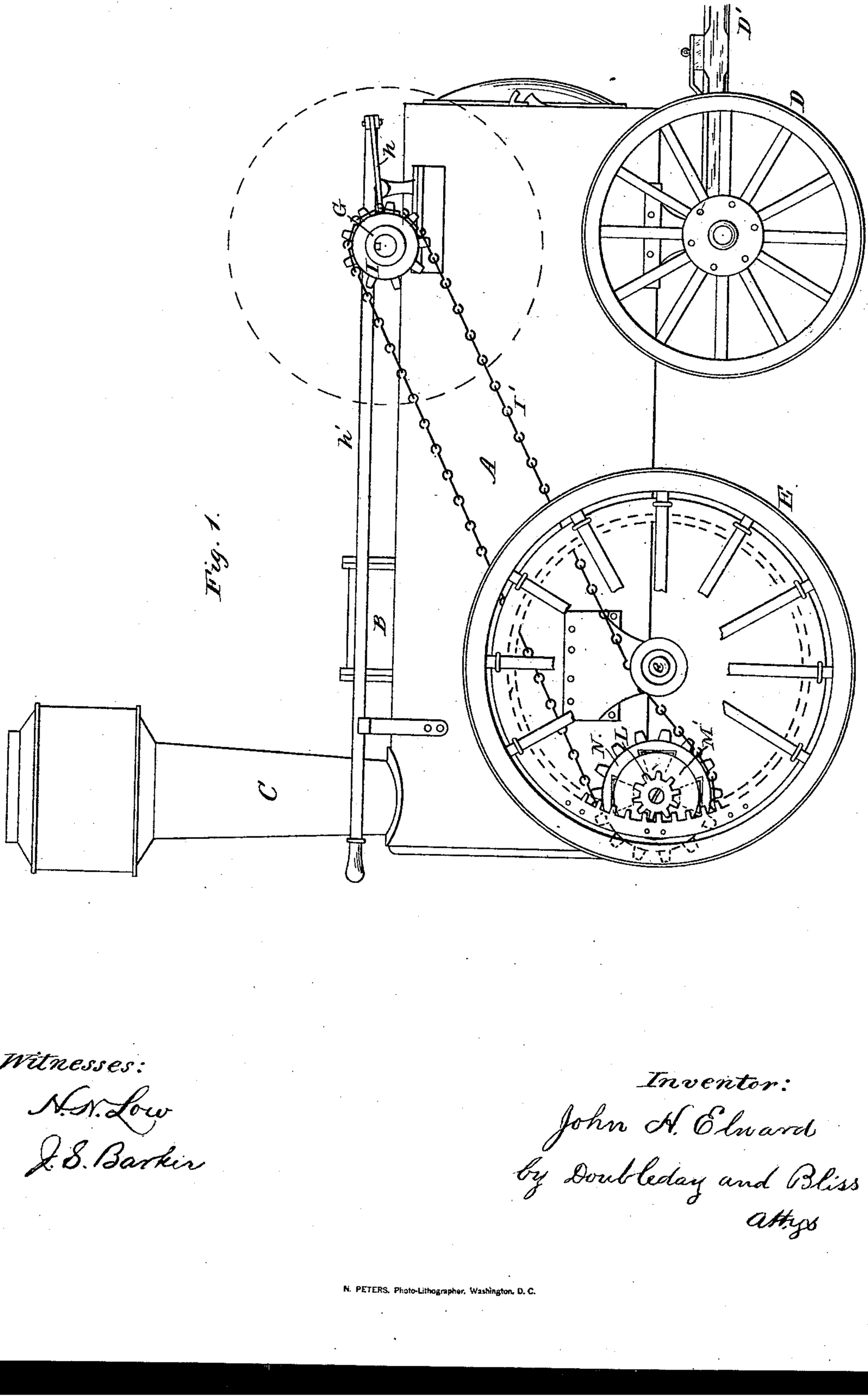

Fig. 1.

Witnesses:
N. N. Low
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Inventor:
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Attys

(No Model.)

2 Sheets—Sheet 2.

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Fig. 2.

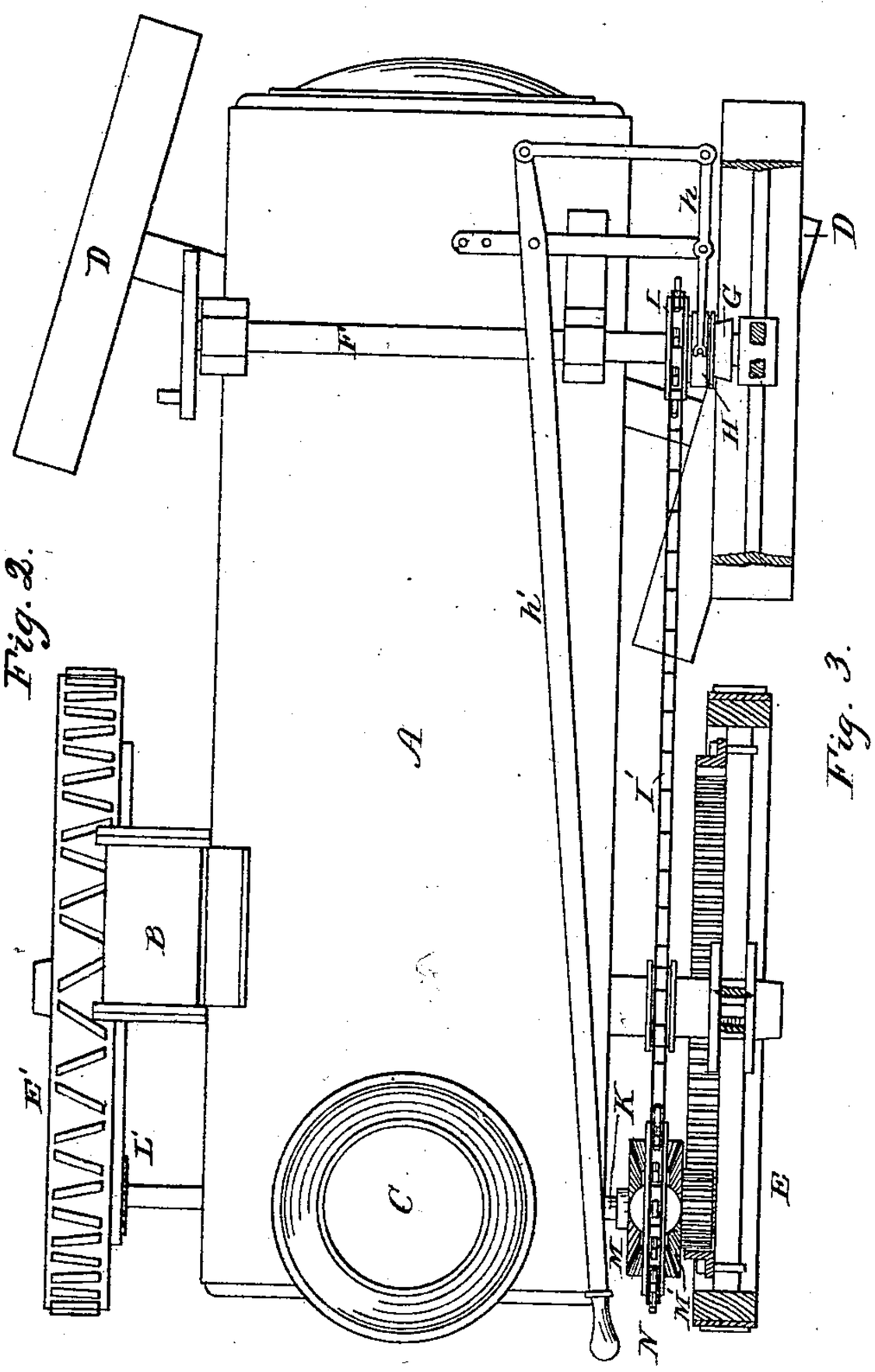
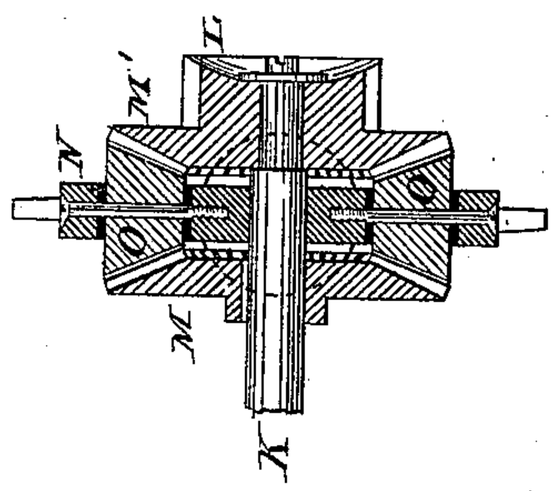


Fig. 3.



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UNITED STATES PATENT OFFICE.

JOHN H. ELWARD, OF STILLWATER, MINNESOTA.

TRACTION-ENGINE.

SPECIFICATION forming part of Letters Patent No. 272,670, dated February 20, 1883.

Application filed December 21, 1880. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. ELWARD, a citizen of the United States, residing at Stillwater, in the county of Washington and State of Minnesota, have invented certain new and useful Improvements in Traction-Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

The object of this invention is to so construct a traction-engine that it can be readily started after it has come to rest in the position occupied by it while in the operation of turning.

To this end it consists in the combination, with a compensating-gear which permits the power to be applied by both driving-wheels equally, of a friction-clutch which permits the speed and power of the engine to be raised to the utmost before connecting the engine with the driving-wheel.

Figure 1 is a side elevation of so much of a traction-engine as is necessary to illustrate my invention. Fig. 2 is a top plan view of the same, some of the parts being broken away for clearer illustration. Fig. 3 is a vertical section of the compensating-gear.

In the drawings, A represents the boiler; B, the cylinder; C, the smoke-stack; D, the truck-wheels, and D′ the tongue, all of which parts may be of the ordinary or any preferred character.

E E′ are the driving-wheels, mounted on independent shafts *e e*, or mounted loosely on a through-axle.

F represents the main shaft of the engine, carrying at one end the usual fly or band wheel.

G is a cone keyed to the shaft, and intended as the stationary part of the friction-clutch.

H is a hollow cone, mounted and arranged to slide loosely upon the shaft F. It forms the other or movable part of the friction-clutch, the concave opening in the end being constructed to fit tightly the convex surface of the stationary part G. The wearing-surfaces of the convex and concave parts of the clutch may, if desired, be constructed of soft metal or paper, or any other material used for frictional bearing-surfaces, though in practice I have found that clutches of cast metal answer very well for ordinary purposes. Any suitable mechanism may be combined with the movable part of the clutch to slide it to and from the stationary part. In the drawings I have shown a forked lever, *h*, pivoted to an arm or some stationary part of the boiler, and arranged to engage with the sliding part of the clutch in a well-known manner. The forked lever is oscillated by means of a hand-lever, *h′*, extending to the driver's platform.

I represents a sprocket-wheel formed with or attached to the sliding part H of the friction-clutch. The wheel is connected with the mechanism which engages with the driving-wheels by means of a chain, I′.

K represents a counter-shaft or supplemental shaft, mounted beneath the boiler on a line parallel to the axis of the driving-wheels, and in suitable proximity to the peripheries thereof, either in front or in rear, the latter being preferred and being shown in the drawings.

L′ is a spur-pinion keyed to the counter-shaft at one end thereof, and L is a spur-pinion mounted loosely upon the shaft at the other end. These pinions are arranged to engage respectively with the opposite driving-wheels E E′.

M is a bevel-wheel keyed to the counter-shaft, and M′ is a bevel-wheel, of the same diameter, formed with or attached to the loose pinion L.

N is a sprocket-wheel receiving power from the wheel I through chain I′. The sprocket-wheel N engages with the bevel-wheels M and M′ by means of pinions O O, carried by the chain-wheel N, the wheel having recesses formed in it for the mounting and supporting of the pinions.

The parts K, L, L′, M, M′, N, and O constitute a compensating-gear of substantially the character now well known. When the power is transmitted by these devices it is imparted to both driving-wheels equally at all times, as is well known, and hence in order to turn an engine on a curved path a compensating mechanism of substantially this character is indispensable. By combining with this mechanism a friction-clutch I am enabled to impart the utmost power to the engine at any instant in

equal degrees to the driving-wheels. Without the compensating-gear the power enhanced by the clutch would be all exerted upon one wheel, and even this greatest power thus exerted upon but one wheel is insufficient to start an engine of ordinary weight. Without the clutch the engine cannot get up enough momentum to overcome the inertia of the machine, although a compensating-gear be employed.

If desired, the devices hereinbefore described may be combined with any suitable mechanism for transmitting power, this invention pertaining especially to the combination of the friction-clutch with the compensating-gear.

I am aware that it is not new to apply power from the engine to independently-moving traction-wheels through the medium of a compensating-gear, a clutch, and a friction-connection between one member of said clutch and a shaft upon which the friction-connection is mounted; but in such prior construction the clutch was provided with interlocking faces or projections which rendered it impossible to operate the mechanism in the same manner as mine is capable of being operated or of producing the same results.

What I claim is—

In a traction-engine, the combination of the following elements, namely: two supporting and driving wheels which can rotate independently of each other, a compensating-gearing through which power may be applied to both driving-wheels equally when they are rotating at different speeds, a driving-engine, and a friction-clutch mechanism interposed between the driving-engine and the compensating-gearing mechanism, whereby the engine may be put into full motion and its momentum then transferred equally to both driving-wheels, substantially as set forth.

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

JOHN H. ELWARD.

Witnesses:

H. H. DOUBLEDAY,

H. H. BLISS.