

**No. 683,922.**

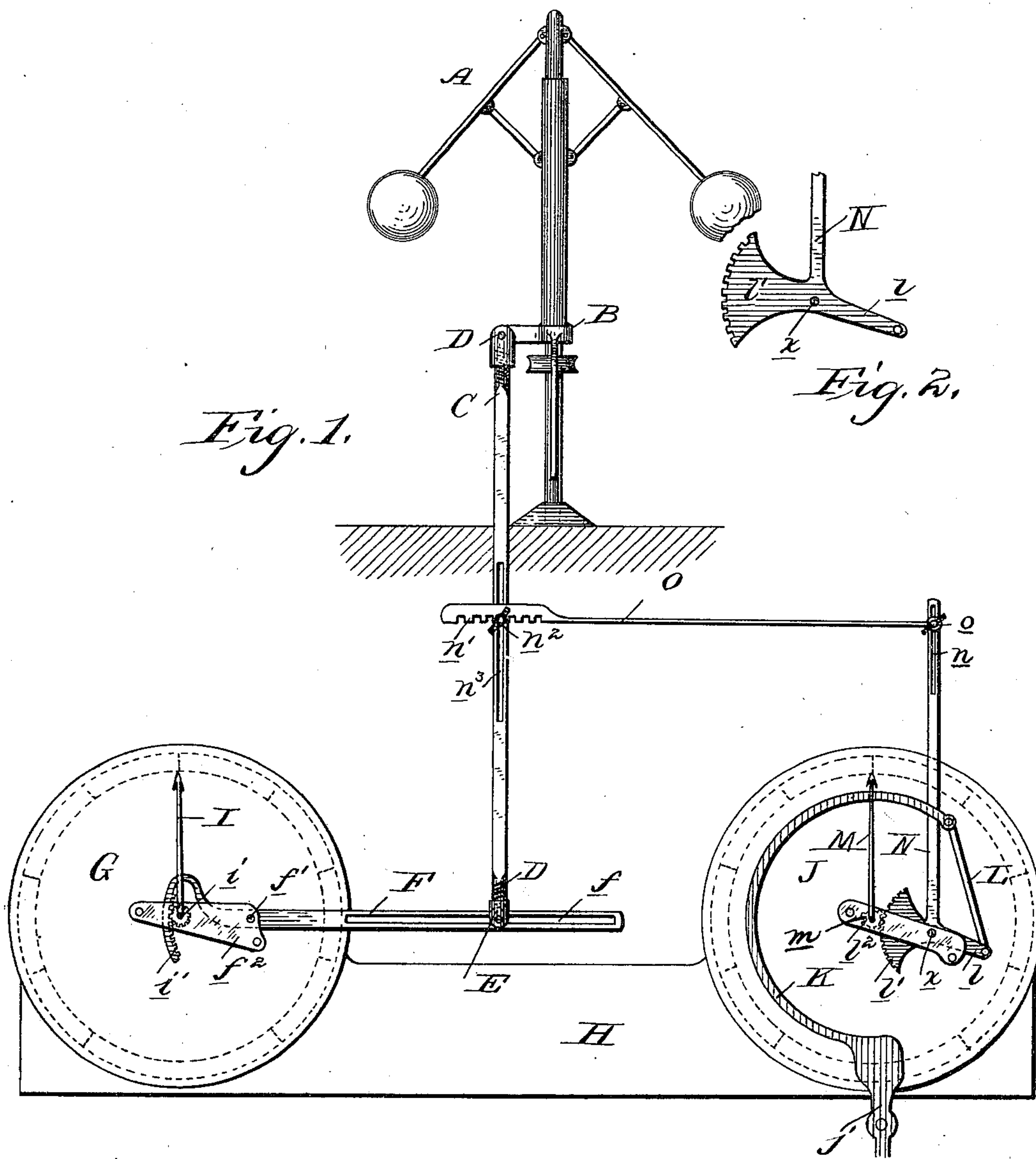
**Patented Oct. 8, 1901.**

**E. FORTIER.**

## AUTOMATIC HORSE POWER INDICATOR FOR ENGINES.

(Application filed Oct. 29, 1900.)

(No Model.)



**WITNESSES:**

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# UNITED STATES PATENT OFFICE.

EDMOND FORTIER, OF KANKAKEE, ILLINOIS.

## AUTOMATIC HORSE-POWER INDICATOR FOR ENGINES.

SPECIFICATION forming part of Letters Patent No. 683,922, dated October 8, 1901.

Application filed October 29, 1900. Serial No. 34,759. (No model.)

*To all whom it may concern:*

Be it known that I, EDMOND FORTIER, a citizen of the United States, residing at Kankakee, in the county of Kankakee and State of Illinois, have invented certain new and useful Improvements in Automatic Horse-Power Indicators for Engines; and I do 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 the letters of reference marked thereon, which form a part of this specification.

This invention relates to a new and novel indicator designed to be calibrated for a steam-engine of known approximate boiler-pressure and connected to the centrifugal ball-governor and pressure-gage thereof to be operated conjointly therewith to indicate approximately the power delivered by the engine to either side of the normal load.

The novel details in the construction and arrangement of the several parts will be apparent from the detailed description hereinafter and the drawings forming part hereof, wherein an embodiment of the invention is delineated for the sake of illustration.

When referring to the drawings, like reference characters will refer to corresponding parts in both views.

Figure 1 is an elevational view, and Fig. 2 is a detail view, of one of the levers.

Referring more specifically to said drawings, A designates a centrifugal ball-governor of any ordinary or preferred construction used in connection with a steam-engine for regulating the speed thereof by automatically manipulating the inlet and outlet valves in a manner too well known to require illustration.

B is the sliding sleeve, adapted to reciprocate upon the governor-shaft, and to one side thereof is secured the main operating-rod C. This operating-rod has screw-threaded adjustable connections D at its respective ends, so that its length may be properly varied, and is at its lower end provided with a slidable connection E, adapted to work in a slot  $f$  of a horizontally-disposed lever F. The lever

F is of any suitable length and is pivoted near its outer end at  $f'$  in the bracket  $f^2$ , said bracket being in turn supported between the dial-plate (dotted lines) and the back plate of a power-indicator G. The indicator is attached to one end of a rigid base H, fastened to a convenient stationary portion of the engine. Beyond its pivotal point the lever F is provided with a toothed segment  $i$ , adapted to mesh with the teeth of a pinion carried on the shaft of a hand or pointer I. To the opposite end of the base H is rigidly secured a pressure-gage J, the indicator-face plate of which is also shown in dotted lines to afford clearness in illustrating the interior mechanism thereof. Entering the casing of this indicator at any desirable point, preferably at the bottom thereof, is a pipe  $j$ , leading from the steam-boiler of the engine and connecting interiorly with an expansible tube K, of the Bourdon type, confined within the gage-casing. To the extreme end of this tube is a pivotally-connected link L, said link in turn being pivoted at its lower end to a projection  $l$ , integral with and extending to the rear of a bell-crank lever N. The lower arm of this bell-crank lever is somewhat enlarged at its end and formed into a toothed segment  $l'$ , which in its movement is kept in proper position relative to the other parts of the device by a guard-plate  $l^2$ , bolted to the casing. The teeth  $l'$  are arranged to mesh with and revolve a pinion  $m$ , secured to the shaft of an indicator hand or pointer M. Intermediate of the segment portion and the end of the projection on the bell-crank lever, Fig. 2, the same is pivoted to the casing, as at  $x$ . The vertical member of the lever is provided at its upper portion with an elongated slot  $n$ , in which is adjustably secured at  $o$  a horizontally-disposed rod O, which is designed to connect said member with the main operating-rod C. At the point of connection between these two last-mentioned rods the rod O is flattened for a portion of its length and provided with a series of teeth  $n'$ , adapted to fit over a pin or block  $n^2$ , adjustably secured in a slot  $n^3$  in the rod C.

In operation the power-indicator will be operated to correspond with the fluctuations



of the governor, and the leverage between the connecting devices intermediate of the two will be automatically adjusted through the medium of the pressure-gage and its connection therewith.

From the above it will be seen that the invention herein is one which when in practical operation will be of valuable service, while at the same time it is in its nature comparatively simple.

The invention is considered to be broad in its scope, and while the drawings illustrate one form thereof it is to be understood that many changes in the details of the construction and operations of the several parts may be made without in the least departing from the nature and spirit of the invention.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. The combination with a steam-engine governor and steam-pressure gage, of a power-indicator, and means for operating said indicator comprising an operating-lever communicating therewith, a rod connected at one end to the governor, a shiftable connection between the operating-lever and the opposite end of said rod, and connecting means for the pressure-gage.

2. The combination with a steam-engine governor, and steam-pressure gage, of a power-indicator, and means for operating said indicator comprising an operating-lever, a connecting-rod between the governor and said lever, adjustable means for connecting said rod to the lever, and connecting means for the pressure-gage, substantially as described.

3. The combination with a steam-engine governor, of a power-indicator, a lever for operating said indicator, a rod between the governor and said lever, means for adjusting the length of said rod, and means for connecting

said rod to the governor, lever and pressure-gage respectively, substantially as described.

4. The combination with a steam-engine governor, and steam-pressure gage, of a power-indicator, connecting means between the governor and power-indicator, and other adjustable connections intermediate of said connecting means and the pressure-gage, substantially as described.

5. The combination with a steam-engine governor and steam-pressure gage, of a power-indicator, means between the governor and the power-indicator for operatively connecting the same, means for operating the pressure-gage comprising an expansible tube, an inlet to said tube, a bell-crank lever operatively connected to said tube, means on the said lever for operating the indicator-pointer of the pressure-gage, and an adjustable connection between said bell-crank lever, and the connecting means intermediate of the governor and power-indicator, substantially as described.

6. The combination with a steam-engine governor and steam-pressure gage, of a power-indicator, means for connecting the governor with the power-indicator, means for operating the pressure-indicator comprising an expansible tube, an inlet for said tube, a bell-crank lever, a segment on said lever, a pointer provided with a pinion in mesh with said segment, an extension on said lever connecting the same with the expansible tube, and suitable connections between said lever and the connecting means intermediate of the governor and power-indicator.

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

EDMOND FORTIER.

Witnesses:

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