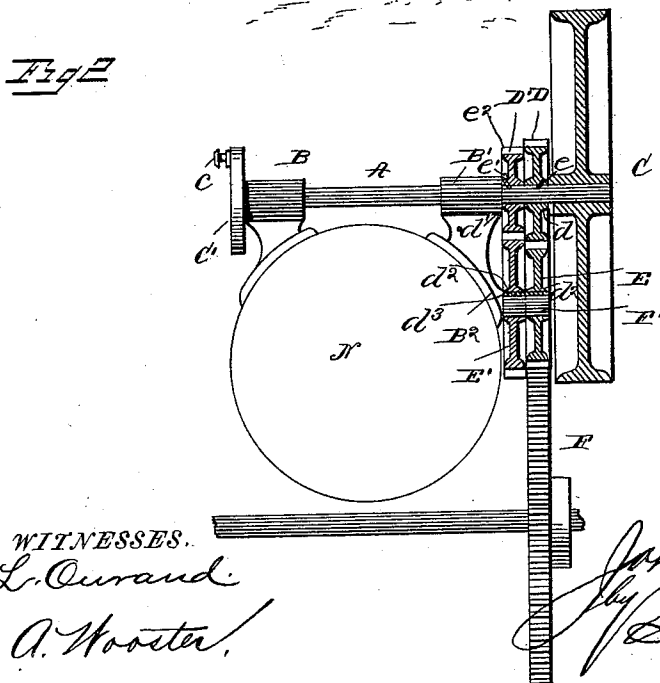
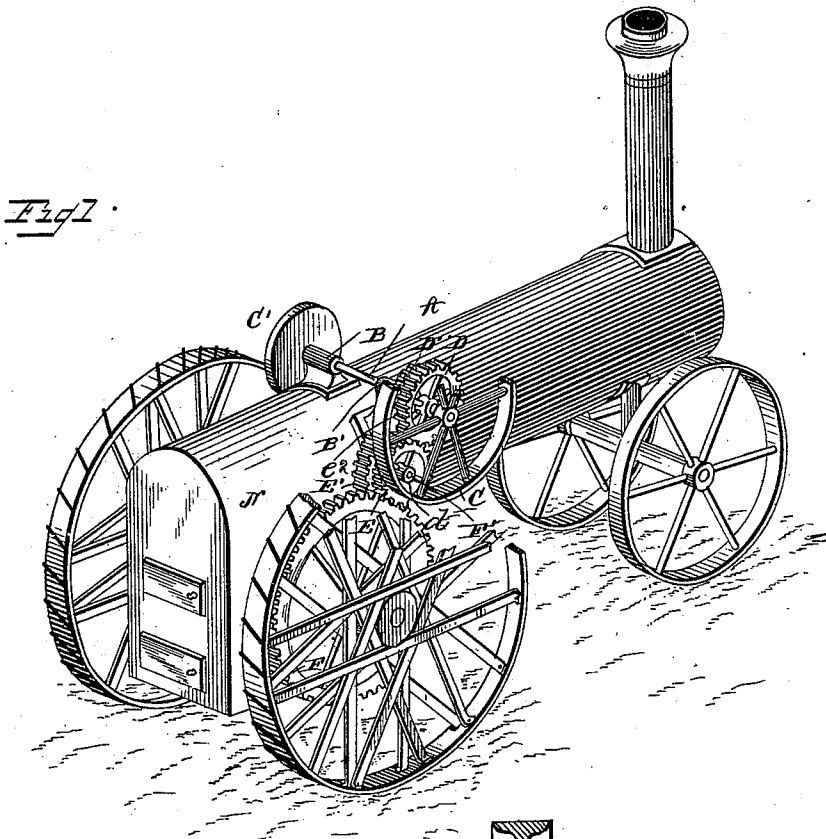


(No Model.)

J. W. STRINGER.
GEARING FOR ROAD ENGINES.

No. 403,000.

Patented May 7, 1889.



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UNITED STATES PATENT OFFICE.

JOHN W. STRINGER, OF MARION, OHIO.

GEARING FOR ROAD-ENGINES.

SPECIFICATION forming part of Letters Patent No. 403,000, dated May 7, 1889.

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To all whom it may concern:

Be it known that I, JOHN W. STRINGER, a citizen of the United States, and a resident of Marion, in the county of Marion and State of Ohio, have invented certain new and useful Improvements in Machinery for Increasing and Decreasing the Speed of Engines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to certain new and useful improvements in the machinery for increasing or decreasing the speed motion of engines, and relates more especially to the controlling of the rotary motion imparted to the drive-wheel of traction-engines, as hereinafter more fully set forth and described in the specification and drawings.

The general object of my invention consists in providing suitable gear mechanism working upon a rotary shaft for imparting an increase or decrease to the rotation of the drive-wheel through the intermediate gear mechanism.

Having thus stated generally the object of my invention, I shall now proceed by reference to the accompanying drawings, forming a part of this application, to point out more specifically the operation and detail of construction of the same, so as to enable others more readily to understand its workings.

Reference is to be had to the accompanying drawings, wherein similar letters denote corresponding parts, and in which—

Figure 1 is a perspective view showing my improvement as attached to an ordinary traction-engine. Fig. 2 is a cross-section taken through Fig. 1, showing intermediate gears, E E', connected together by key-bolt d^3 .

N is the boiler of the engine, but which forming no part of my invention, I do not deem it necessary to herein further describe the same.

B and B' indicate the bearings situated at either side on top of the boiler N, and through which the rotary shaft works for imparting motion to the gear mechanism, as hereinafter more fully explained and pointed out. These

bearings may be bolted to said boiler or secured thereto in any convenient manner. The bearing B' is provided with the lower downward-extending base, B².

A is the rotary shaft, working in the bearings B and B', and which has formed or secured upon the outer end thereof the balance-wheel C and upon the other end the crank-wheel C'. The wheel C' is provided upon its outer face with the wrist-pin c, to which the piston-rod of the engine connects, through which means the rotary shaft is caused to revolve, and with it the gear mechanism.

D and D' indicate the gear-wheels, working upon the rotary shaft A. These gear-wheels are provided with hubs d d , and said flanges have holes formed therein which correspond with similar ones formed in the rotary shaft, before described. The said holes are or may be made screw-threaded to receive the screw-threaded bolts, by which means the gear-wheels are secured to the aforesaid shaft. I am thus enabled to cause the wheel D to move loosely upon the shaft or to be rigidly connected thereto, as may be desired.

While the gear-wheels are so constructed as to allow of their being made loose or rigid upon the shaft, it is, nevertheless, essential to the perfect operation of my machinery that the wheel D' be made rigid with the shaft, so as to revolve therewith, and that the gear-wheel D be so constructed as to be made loose or rigid, as desired. Of course I do not wish to be understood as stating that the inner gear-wheel must always be made rigid by reason of having described the one in the drawings as being so, for I am aware that the relative position of the two may be shifted—that is, the one D be placed inside and the one D' on the outside; but when this change is made there must be a corresponding change in the after-described machinery.

It will be understood that I may change the form of the connection herein shown between the gear-wheels and the shaft A and make the connection in any desired manner—as, for instance, the wheel D may have its motion imparted through the medium of the balance-wheel C by being secured thereto in any suitable manner. Both of these gear-wheels are provided upon their outer circumferential faces with notches or teeth e^2 , which mesh with

similar ones formed upon the intermediate gear-wheels, E and E'. The inner gear-wheel, D', is considerably less in diameter than companion wheel D, the object of which will be hereinafter fully explained.

E and E' are the intermediate gear-wheels, having teeth formed upon their outer circumferential faces and meshing with corresponding ones formed in the gear-wheels D and D', as above stated. These wheels are also provided with hubs d^2 d^2 , and are provided with suitable means (such as key-bolt d^3) for securing the flange of one gear-wheel to that of the other, so that the two may be made, when so desired, to move in unison; but the gear E', when not thus secured or connected to the gear E, will revolve loosely upon the shaft F'. The intermediate gear E', when connected to the gear E, enables me to impart rotary motion thereto through the medium of the gear-wheel D' when the gear-wheel D is working loosely upon the shaft A. The intermediate gear E' is considerably larger than the gear-wheel E, and is thus constructed for the purpose of allowing the same to mesh with the gear-wheel D', which is smaller in its circumference than the gear D. Of course when the intermediate gear-wheel E' is disconnected and working loosely upon the shaft F' the motion imparted thereto by the working gear-wheel D' is unused. As above stated, if the gear-wheels D and D' change position from the outer to the inner, the intermediate gears, E and E', must be in a like manner changed—that is, the gear E' will be shifted from the position now occupied thereby to the outer end of the shaft F' or the position occupied by the wheel E, and the wheel E will occupy the position of the gear-wheel E'. By thus changing the positions of the intermediate gears to correspond with changes made in the position of the gear-wheels D and D', I am enabled to keep the gear-wheels always in the same relative position to one another.

The teeth formed upon the outer circumferential face of the intermediate gear E mesh with corresponding ones formed upon the drive-wheel F, and the revolution of the former necessarily imparts motion to the latter, which in turn imparts rotary motion through suitable connections to whatever machinery required. By means of the intermediate gear-wheels, E and E', acting by rotation of the gear-wheels D and D', I am enabled to control the speed of the drive-wheel.

F' represents the rigid shaft, secured at one end to the downward-extending base B² of the bearing B'. Upon this shaft the intermediate gear-wheels, E and E', loosely revolve. This shaft, if so desired, may form a part of the bearing B', or the wheel E may be rigidly secured to the shaft upon its outer end, and the inner end of the same may be secured within bearings formed in the base of the bearing B'.

The drive-wheel F imparts motion to the machinery; but as this forms no part of my

invention I do not deem it necessary to further describe the same, merely stating that it is of ordinary construction and used for the accomplishment of the above-named purpose.

When it is desired to increase the rotary speed of the drive-wheel F, the gear-wheel D is secured to the rotary shaft A, and, meshing with the intermediate gear-wheel E, imparts rotary motion thereto, and this gear through its outer teeth meshing with corresponding ones formed upon the drive-wheel F causes the revolution thereof and imparts like motion to the machinery required through suitable connections thereto. To decrease the revolution of the drive-wheel, disconnect the gear-wheel from the rotary shaft A and connect the intermediate gear-wheel E' to the intermediate wheel E, thereby causing the two to revolve in unison, and let the gear-wheel E receive its motion by means of the intermediate wheel E' through the medium of the gear-wheel D', permanently fastened to the rotary shaft A. It will be readily understood that the motion of the smaller gear-wheel D', being imparted to the larger intermediate wheel E', will cause the latter to revolve a less number of revolutions per minute than the intermediate wheel E, deriving its motion from the larger gear-wheel D, and consequently the intermediate wheel E', being connected to the intermediate wheel E, will cause a like decrease in the number of the latter's revolutions, and necessarily a decrease in the motion of the drive-wheel F.

I am thus enabled by providing the gear mechanism, as hereinbefore described, to regulate and govern the speed of the drive-wheel from fast to slow with very little loss of time resulting thereby.

Having thus fully described my invention, what I claim as new, and desire to secure protection in by Letters Patent of the United States, is—

The combination, with the shaft A, the wheel C, having the wrist-pin c , the bearings B B', the latter having the depending portion B², and the shaft F', standing outward from said depending portion at a proper point, of the gear-wheels D D', the former of which is rigid on the shaft A, while the latter can either turn loosely thereon or be fixed by the set-screw e , the gear-wheel E, fixed on the shaft F' and meshing with the wheel D, the gear-wheel E', turning loosely on the shaft F' and meshing with the wheel D', and the bolt d^3 , to connect the gear-wheels E E' and cause them to turn in unison, substantially as specified.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

JOHN W. STRINGER.

Witnesses:

M. V. PAYNE,
THOMAS J. RYAN.