

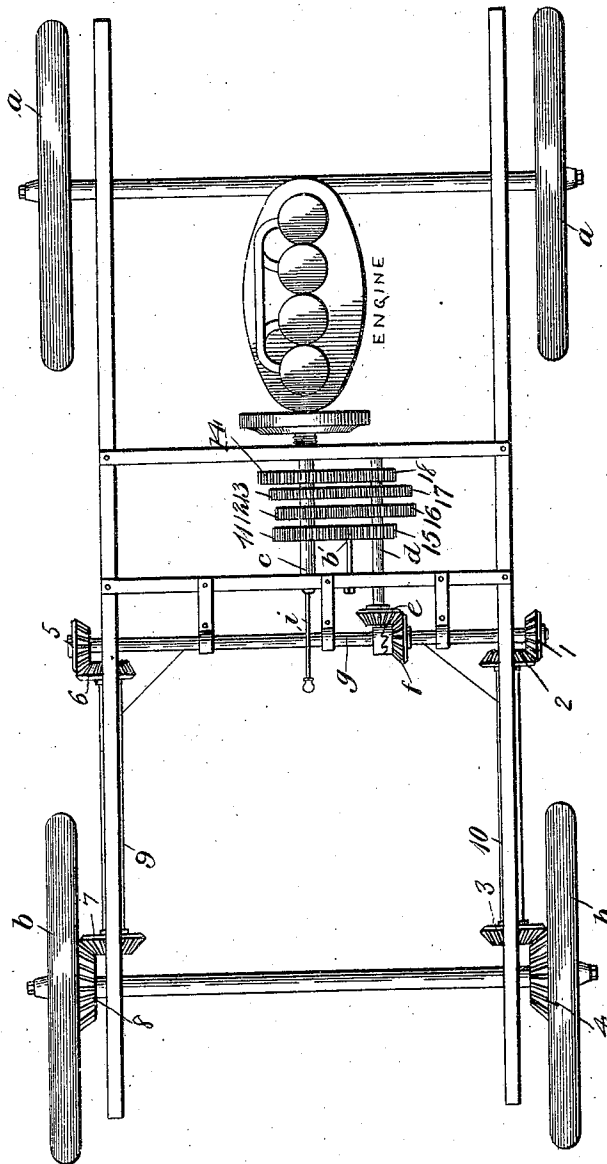
No. 847,115.

PATENTED MAR. 12, 1907.

R. E. RUCKER.
SPEED REGULATOR.
APPLICATION FILED DEC. 14, 1905.

3 SHEETS—SHEET 1.

Fig. 1.



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Witnesses:

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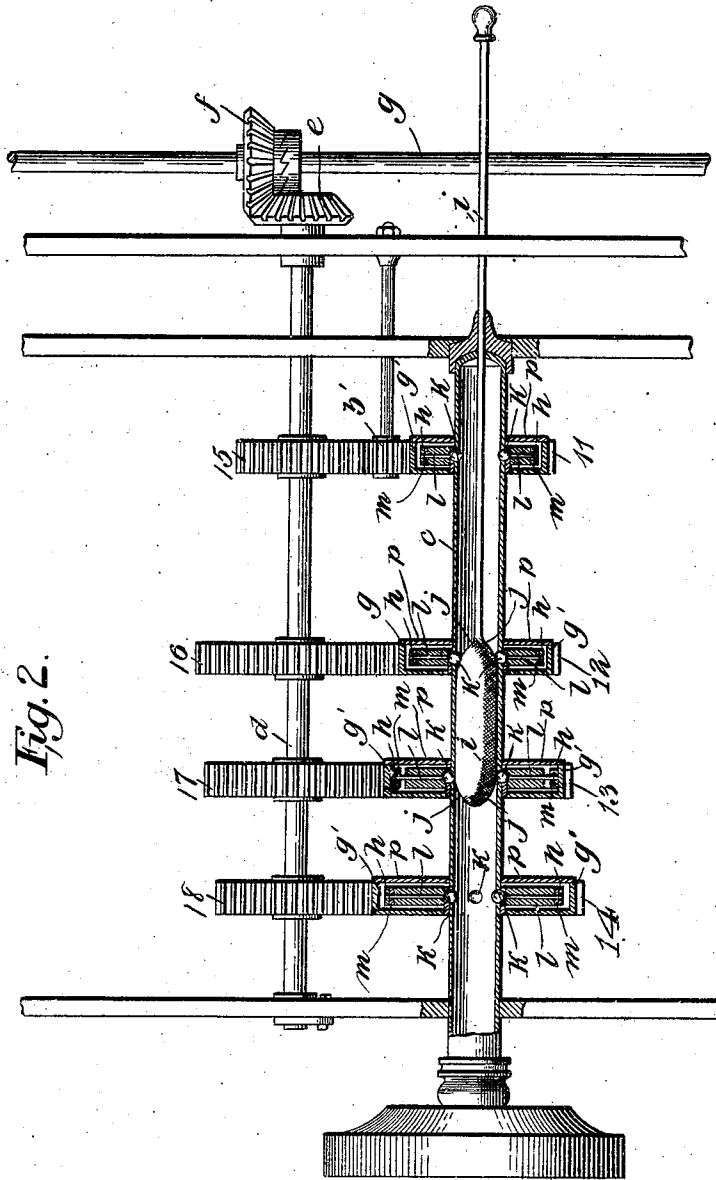


Fig. 2.

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3 SHEETS—SHEET 3.

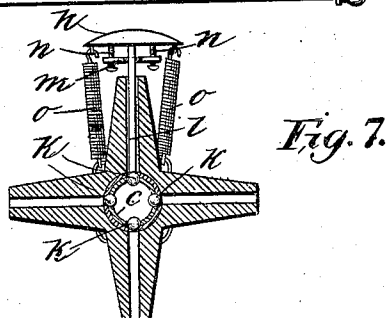
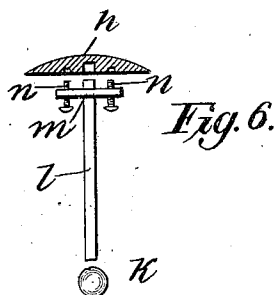
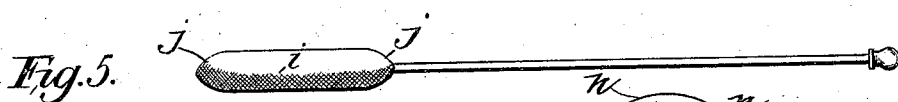
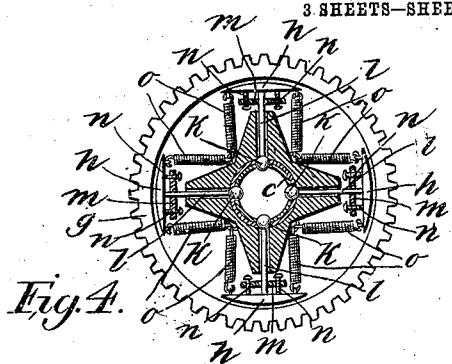
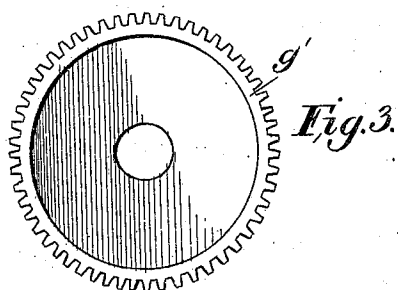
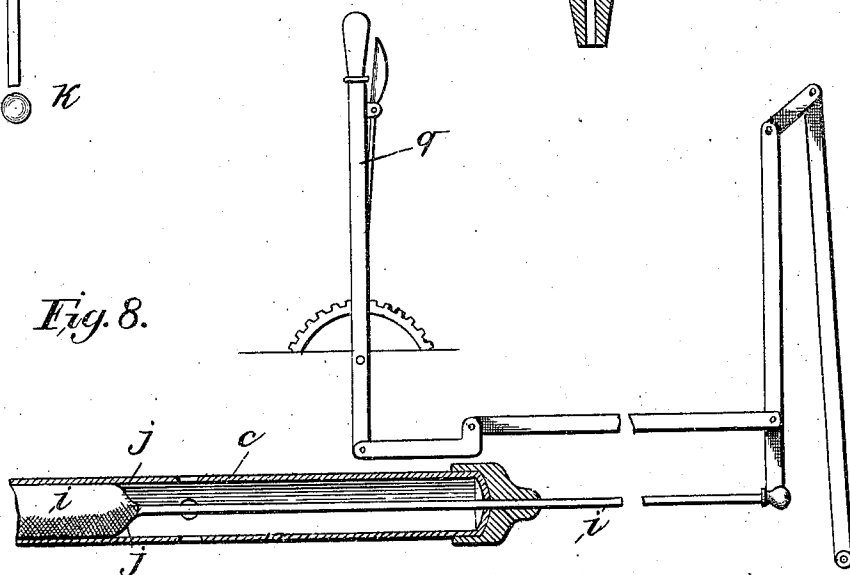


Fig. 8.



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UNITED STATES PATENT OFFICE.

RUFUS EUGENE RUCKER, OF LONGBEACH, CALIFORNIA, ASSIGNOR OF ONE-HALF TO MELVILLE SCOTT RUCKER, OF LONGBEACH, CALIFORNIA.

SPEED-REGULATOR.

No. 847,115.

Specification of Letters Patent.

Patented March 12, 1907.

Application filed December 14, 1905. Serial No. 291,706.

To all whom it may concern:

Be it known that I, RUFUS EUGENE RUCKER, a citizen of the United States, residing at Longbeach, in the county of Los Angeles and State of California, have invented certain new and useful Improvements in Speed-Regulators, of which the following is a specification.

The invention comprises mechanism whereby a driven shaft may be rotated at various speeds relative to that of a driving-shaft.

To make the use or operation of the invention still easier of understanding without in any way limiting the said invention, it may be assumed as applied to an automobile, where the power or motion received or developed may be transmitted and used or applied exactly as desired.

It is the object of this invention to provide a power-transmitter that will operate without jar or shock and be certain in its action. In this invention the motion is transmitted through the intervention of clutch-gears which run on a hollow shaft, the latter having an unvarying speed. The clutch-gears, when it is desired to render them operative, are clutched to their shaft by frictional means operating upon or near their peripheries, where the greatest, or rather the most efficient, power may be developed and employed.

The nature of the invention has already been indicated—namely, the transmission of motion from one shaft to another and the regulation of the motion transmitted through the intervention of gears of varying size, the gear that it is wanted to make effective as the operative gear being clutched or made fast to the operative shaft, while the others are released and left to run loose and with no more effect than if they were not employed at all.

Reference is to be had to the annexed drawings, forming a part of this specification, in which—

Figure 1 is a diagram in plan of an automobile-frame in which my improvement may be employed. Fig. 2 is a diagram of the driver and driven shafts and the gears thereon arranged in parallel order and parts being broken away or shown in section, so as to give a good and clear explanation of the construction and mode of operation of the invention. Fig. 3 is a plan view of one of the clutch-gears drawn to an enlarged scale.

Fig. 4 is a similar view representing the face-plate as removed and showing clearly the constructive character of the clutching means between the shaft and the periphery of the gear covered by the face-plate. Fig. 5 is a separate view of the mandrel or key for operating the clutching means. Fig. 6 is a sectional side view of a clutch-shoe and the immediate means for operating it. Fig. 7 is a view similar to Fig. 6, showing all that is represented in the latter view and some parts in addition. Fig. 8 is a diagram of a portion of the hollow shaft with a form of means that might under some circumstances be employed to operate the key or mandrel to clutch or unclutch gears on the hollow shaft.

The same letters of reference represent the same parts or features, as the case may be, wherever they occur.

Having reference to Fig. 1, it may be understood that it shows a mere outline of parts of a frame and that the rearward wheels are driven from power applied to them, while the forward wheels are pushed along before the rearward gears, as desired. The engine is indicated by the legend to that effect which drives the hollow shaft *c*, and the present improvements are included between the same and the shaft *d*, operated from the shaft *c* and driving the miter-gears *e f*, which turn the transverse shaft *g*, which in turn operate the miter-gears 1, 2, 3, and 4 and 5, 6, 7, and 8 and render active the lateral shafts 9 and 10 and the rear wheels *a* all in a manner that needs no further description here.

The gears 11, 12, 13, and 14 run loose on the hollow shaft *c*, except when clutched thereto, as hereinafter described, and all the gears 15, 16, 17, and 18 are secured to the shaft *d* and turn with it. One of the former group of gears at a time is clutched with one of the gears 15, 16, 17, or 18 and becomes the driving-gear of shaft *d*, according to the position of the key shown in Fig. 5 and according to which of the latter group of gears it is wanted to be the driver, with the degree of speed wanted being kept in view. It should, perhaps, have been before stated that the two groups of gears mentioned vary in size, and hence the speed derived from them depends upon which two gears of the two sets are for the time being in clutch, all as will be well understood by any well-informed mechanic without further description.

Each gear on the shaft *c* has a substantial annular flange *g* (see Fig. 4) on its periphery, so that its face becomes of a cup form, which contains the clutch mechanism shown in the
 5 last-mentioned figure. This gear will run loose on the shaft until made fast thereto by throwing the clutch or brake shoe *h* out radially into engagement with the inside face of the flange *g*, as will be explained. All of the
 10 gears 11, 12, 13, and 14, as stated, are equipped as the one shown in Fig. 4 and which is being at present described, and the gear that it is intended to make operative and driving will have the key or mandrel *i*
 15 passed into the hollow shaft, where it stands, and hence through the gear, and the inclined part *j* of the key *i* will operate on the ball-bearing *k* of each pin *l* and push it and the brake or friction shoes or blocks *h* out radi-
 20 ally against the flange *g* and in this way lock the wheel frictionally to the hollow shaft and make it and the gear on the shaft *d* that it meshes with the driving or operating gear, while all of the others run idle. The cross-
 25 piece *m* and set-screws *n* serve to keep the clutch-shoe *h* in position, the set-screws being adapted to adjust the friction blocks or shoes *h* out or in. Should the shoes *h* not be sufficiently expanded by the means just de-
 30 scribed, they can be adjusted outwardly by the screws *n*. The springs *o* hold the clutch-shoes out of engagement with the flange *g* when the gear is not operative. The face-plate *p* serves to cover the clutch mechanism when the wheel is in use and at other
 35 times, to prevent damage to the same.

The key *i* is of such a length that when it is moved to clutch one wheel with its shaft it instantly releases another, which it had held
 40 in clutched position.

The gear *b'*, intermediate of the gears 11 and 15, is always in mesh with the latter gears, and when gear 11 is made to drive gear 15 gear *b'* operates to drive gear 15 in an oppo-
 45 site direction from the gears 16, 17, and 18, and thus gear 15 is made the back-up gear.

The gear *b'* is provided and arranged as it is to make gear 15 a back-up gear—that is, to drive gear 15 in the opposite direction
 50 from the gears 16, 17, and 18 when operated by a gear 11 on the hollow shaft.

An important function performed by the back-up gears is that of making them serve the purposes and operation of an emergency-
 55 brake, as in case it is desired to stop the machine at once by reversing the lever from whatever position it is adjusted to the back-up and applying it moderately it subserves all the purposes of an emergency-brake, and

from experience it has been shown to per- 60
 form this function most efficiently.

Any suitable form of levers may be employed with the means shown in Fig. 8 for bringing the lever *q* into proper place at a carriage-seat to render it operable to move 65
 the key or mandrel *i*.

The hollow shaft *c* is an important feature of the improvements, since through the mediumship thereof I am enabled to readily operate the clutching and unclutching of the 70
 wheels thereon, and thus regulate the speed, as described. This certainty of operation of the parts, particularly of the clutching devices, is one of the important features of the invention, for if there were slippage of parts the 75
 speed of the vehicle could not be controlled or the movements to control it could not be depended upon. Again, the parts move with great smoothness, allowing change of speed to be made without shock or jar to the 80
 mechanism composing the invention. This is regarded as very important.

I claim—

1. A device of the character described, employing a hollow or tubular shaft, gearing 85
 independent of said shaft, radial arms or rods arranged in connection with said shaft, frictional clutches effective to engage said gearing and adjustable upon said arms or rods and capable of being actuated thereby, 90
 said clutches being automatically controlled by retractable springs connected thereto, near their ends and to a relatively fixed part upon said tubular shaft, and means for actu-
 95 ating said rods or arms.

2. A device of the character described, employing a hollow or tubular shaft, gearing independent of said shaft, radial arms or rods having their inner ends projecting into said tubular shaft and equipped with ball- 100
 bearings, frictional clutches adjustable upon said rods or arms and effective for engagement with said gearing and adapted to be actuated by said arms or rods, retractable springs connected to said frictional clutches, 105
 near their ends and to a relatively fixed part carried by said tubular shaft, and a shipping-mandrel movable within said shaft and adapted for engagement with the ball-bear-
 110 ings of said arms or rods in applying said clutches.

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

RUFUS EUGENE RUCKER.

Witnesses:

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 J. D. JOSEPH.