No. 714,614. Patented Nov. 25, 1902.

S. SCOGNAMILLO & C. H. POSNER.

SPEED REGULATING MECHANISM FOR MOTOR VEHICLES.

(Application filed June 26, 1902.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

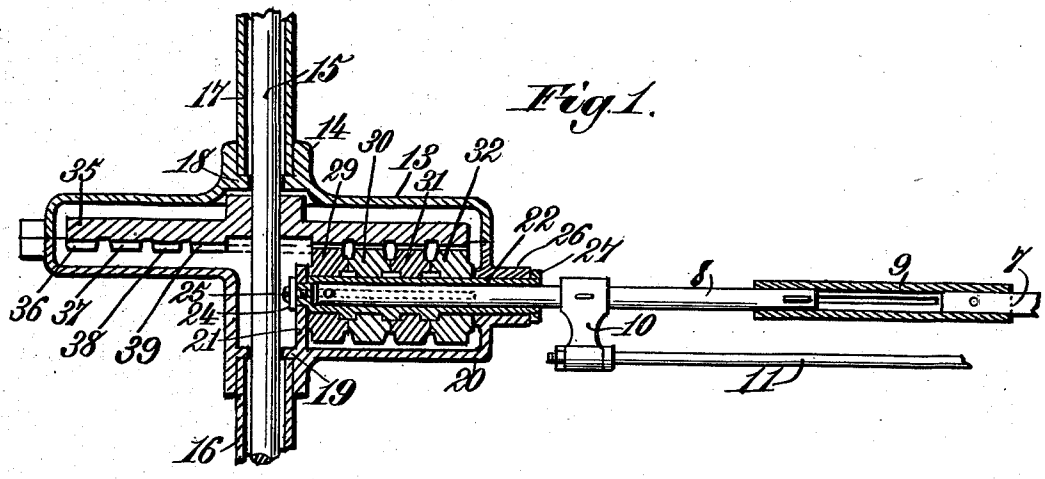

Fig. 3.

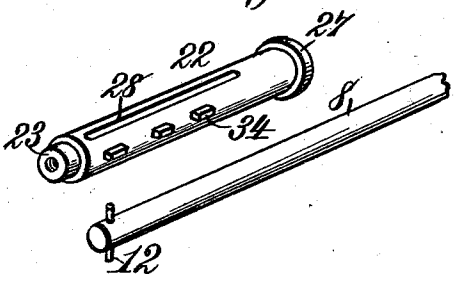

Fig. 2.

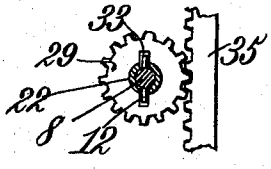

Fig. 4.

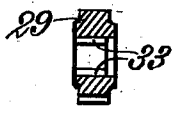

Fig. 5.

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SPEED REGULATING MECHANISM FOR MOTOR VEHICLES.

(Application filed June 26, 1902.)

(No Model.) 2 Sheets—Sheet 2.

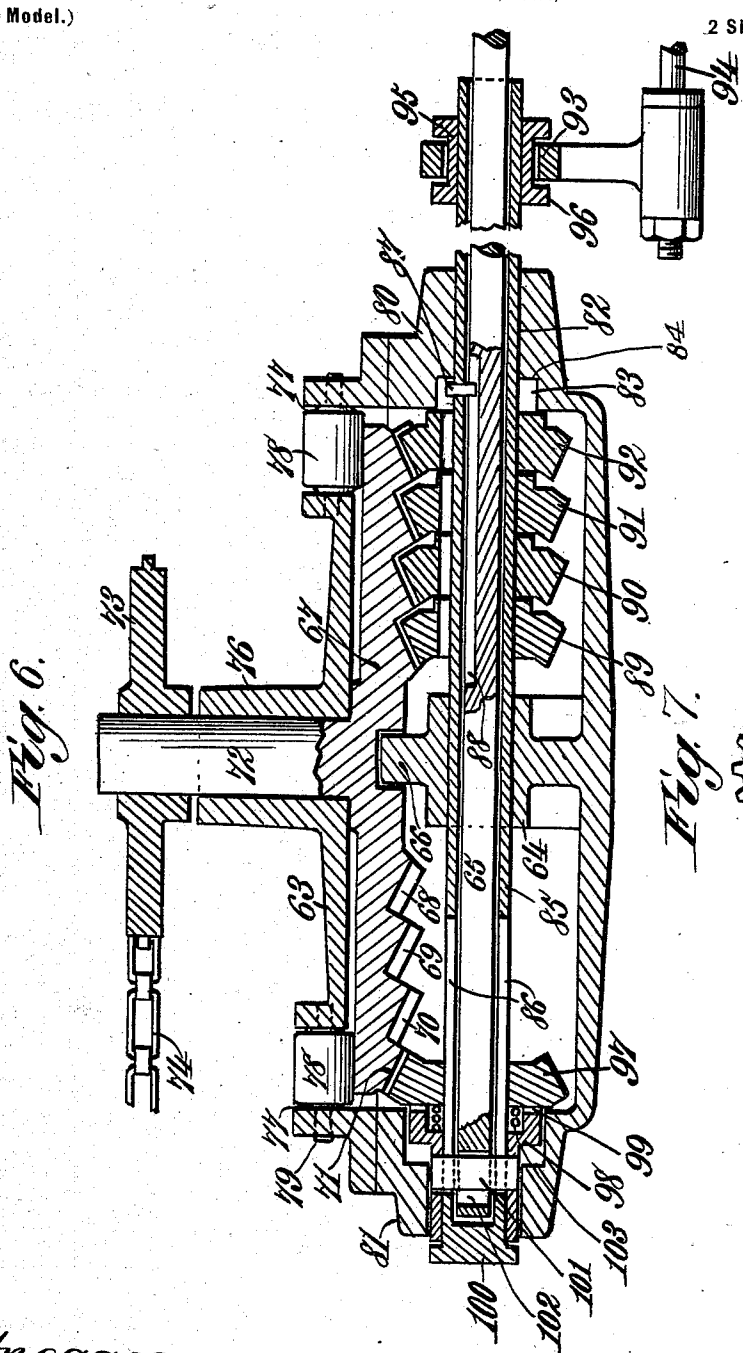

Fig. 6.

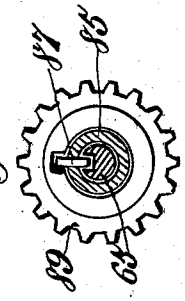

Fig. 7.

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UNITED STATES PATENT OFFICE.

SALVATORE SCOGNAMILLO AND CHARLES H. POSNER, OF NEW YORK, N. Y.

SPEED-REGULATING MECHANISM FOR MOTOR-VEHICLES.

SPECIFICATION forming part of Letters Patent No. 714,614, dated November 25, 1902.

Application filed June 26, 1902. Serial No. 113,354. (No model.)

To all whom it may concern:

Be it known that we, SALVATORE SCOGNAMILLO and CHARLES H. POSNER, citizens of the United States, residing at New York, in the county of New York and State of New York, have invented new and useful Improvements in Speed-Regulating Mechanism for Motor-Vehicles, of which the following is a specification.

This invention relates to certain new and useful improvements in speed-regulating mechanism for motor-vehicles, although the same is applicable to any of the immense class of mechanisms in which a variety of speed changes is desirable.

The invention aims to provide a simple, efficient, durable, strong, and comparatively inexpensive speed-regulating mechanism for motor-vehicles by which the vehicle may be driven at variable speed in either direction; and to this end the invention consists of the novel combination and arrangement of parts hereinafter more specifically described, illustrated in the accompanying drawings, and particularly pointed out in the claims hereunto appended.

In describing the invention in detail reference is had to the accompanying drawings, forming a part of this specification, wherein like numerals of reference indicate corresponding parts throughout the several views, in which—

Figure 1 is a longitudinal sectional view of the mechanism. Fig. 2 is a sectional detail. Fig. 3 is a detail elevation of the pinion-supporting sleeve and movable section of the power-transmitting shaft. Fig. 4 is a sectional detail of one of the pinions. Fig. 5 is a top plan of the mechanism as attached to a rear axle of a vehicle. Fig. 6 is a sectional elevation of a modified form in which the sleeve is adjustable instead of the driven shaft, this view also showing the mechanism for reversing the motion of the face-gear; and Fig. 7 is a cross-section of the rotary shaft and the longitudinally-movable sleeve thereon, showing one of the pinions on said sleeve.

Referring to the drawings, in which our improved speed-regulating mechanism is shown as arranged for use with a motor-vehicle, 1 denotes the engine or power shaft of the vehicle, carrying a pair of loosely-mounted bevel-gears 2 3, between which is arranged upon the shaft 1 the double sliding clutch 4, operated by the lever 5. The clutch 4 is adapted to engage either of the hubs of the bevel-wheels 2 3 for clutching the respective gear-wheel to the engine or power shaft so it will rotate therewith.

The reference-numeral 6 denotes a bevel-gear, which is termed the "transmitting-gear," and is adapted to mesh with either of the bevel-wheels 2 3, so that when either of these bevel-wheels 2 3 is fixed to the shaft 1 and rotates therewith motion will be imparted to the gear 6, driving the power-transmitting shaft, which is constructed of a fixed section 7, the latter carrying the gear 6, and a longitudinally-sliding section 8.

The sections 7 8 of the power-transmitting shaft are connected together by means of the coupling-sleeve 9. The end of the section 7 which projects in the coupling-sleeve 9 is rigidly secured thereto, while the end of the section 8 which extends in the coupling-sleeve is feathered therein, so as to permit a longitudinal movement thereof and to also rotate with the sleeve 9 and section 7.

The reference-numeral 10 denotes an adjusting-arm, which is connected to the section 8 in such a manner as to longitudinally move the said section 8, but to permit the section 8 to rotate. The lower end of the adjusting-arm 10 is connected to the operating-rod 11. This rod 11 is within easy reach of the operator, so it can be moved to shift the section 8 in the desired manner. The free end of the section 8 has connected thereto a coupling-pin 12, which has each end projecting from the section 8. The function of this coupling-pin will be hereinafter described.

The reference-numeral 13 denotes a casing suspended from the vehicle in any desirable manner and which is provided with a pair of bosses 14, through which extends the rear axle 15 of the vehicle. The axle extends entirely through the casing 13 and is surrounded by the tubes 16 17, having one end thereof supported within the annular flanges 18 19, integral with the casing 13, as shown. The casing 13 is formed of two sections, one of which is larger at one side than the other, as at 20, and projecting within this larger portion 20 of one of the sections is an integral extension 21, acting as a support for the in-

ner end of the sleeve 22. The sleeve 22 at its inner end is formed with an integral bearing-stud 23, which extends in an opening formed in the extension 21 and is retained in the said opening by means of the washer 24, connected to the stud 23 by screw 25. The outer end of the sleeve 22 projects from the portion 20 of the casing 13 and is supported within the annular bearing-collar 26, formed integral with the casing 13. The outer end of the sleeve 22 is formed with an annular flange 27, which abuts against the collar 26. The sleeve 22 is mounted for rotation within the casing 13; but its longitudinal movement is arrested, owing to the washer 24 and flange 27. The sleeve 22 is formed with a longitudinally-extending slot 28 in each side thereof and which extends almost the entire length of the sleeve, and through the slots 28 the ends of the pin 12, carried by the section 8 of the power-transmitting shaft, are adapted to project.

Mounted upon the sleeve 22 is a series of power-transmitting pinions 29, 30, 31, and 32. We have shown four pinions; but their number may be increased or diminished as desired. These pinions are loosely mounted upon the sleeve 22 and in their inner face are provided with a pair of diametrically opposite grooves 33, which are adapted to aline with the grooves 28 in the sleeve 22, and these grooves 33 are adapted to receive the ends of the pin 12, so that the respective pinion will be fixed to the sleeve or connected to the sleeve and to the section 8 of the power-transmitting shaft, so that motion will be imparted to the said pinion. The section 8 is adjusted so that the pin 12 will engage in the pinion desired. The pinions are suitably spaced apart and retained in such position by means of the lugs 34, fixed upon the sleeve 22. Each of these lugs 34 extends within and between a pair of the pinions, the latter being suitably grooved to receive the lugs. Fixed to the rear axle 15 is a face-gear 35, having one of its faces provided with a concentrically-arranged series of rows of teeth 36, 37, 38, and 39, the teeth of the row 36 adapted to mesh with the pinion 32, the teeth of the row 37 adapted to mesh with the pinion 31, the teeth of the row 38 adapted to mesh with the pinion 30, and the teeth of the row 39 adapted to mesh with the pinion 29.

The operation of the mechanism is as follows: Assuming that the clutch has been shifted so that the wheel 3 will be connected to the engine or power shaft 1, which is rotating in the direction of the arrow, motion will be imparted to the gear 6, rotating the power-transmitting shaft in the direction as indicated by the arrow. Previous to the clutching of the gear 3 to the power-shaft the section 8 has been adjusted so that the pin 12 will engage within the grooves of the desired pinion, so that the said pinion will be connected to the power-transmitting shaft. It will be assumed that the pin 12 has connected the pinion 32 to the power-transmitting shaft. When motion has been imparted to the power-transmitting shaft in the manner before described, the pinion 32 will be rotated and meshing with the teeth 36 of the face-gear 35 will rotate the said face-gear 35 and impart motion to the rear axle 15 of the vehicle. It will be obvious that as the pinion 32 meshes with the row of teeth 36, which is of the greatest diameter, the speed of the vehicle will not be as great as if the pinion 31 or 30 or 29 were in engagement with the row of teeth 38, 37, or 36, respectively, which are of smaller diameter. If it be desired to increase the speed of the vehicle, the pin 12 and section 8 is shifted to connect the pinion 31 to the section 8 or the pinion 30 to the section 8 or the pinion 29 to the section 8.

In the modified construction shown in Figs. 6 and 7, 63 denotes a casing which is suspended from the vehicle in any suitable manner, and it is provided interiorly with an upwardly-extending bearing 64, provided with an opening, through which extends the driven shaft 65, the latter being connected or coupled to the engine in any suitable manner, and the top of the bearing 64 is formed with a stud 66 for supporting the face-gear 67, the latter being provided with rows of concentrically-arranged teeth 68, 69, 70, and 71. Integral with or suitably connected to the upper face of the face-gear 67 is a shaft 72, carrying a sprocket-wheel 73, which operates the sprocket-chain 74 for driving the rear axle of the vehicle. When the face-gear is operated, motion is imparted to the shaft 72, which in turn rotates the wheel 73 and causes movement to the chain 74, imparting motion thereby to the rear axle, consequently moving the vehicle. The casing 63 is formed with a bearing-collar 76 for the shaft 72 and is also provided with the openings 77, in which are mounted the bearing-rollers 78 for the face-gear 67. These rollers are provided with suitable studs 79, mounted in the casing, as shown.

At one end of the casing 63 the sleeve 80 is formed integral and at the opposite end the sleeve 81 is formed integral therewith, each of which has the inner face formed of two different diameters, as at 82 83, forming a shoulder 84. Extending through the casing 63 and mounted upon the shaft 65 is a shiftable sleeve 85. The sleeve at one end is provided with a pair of diametrically opposite elongated slots 86 and at its opposite end carries a pin 87, which is adapted to engage in a longitudinally-extending groove 88 in the shaft 65. The function of the pin extending in the groove 88 is to cause the rotation of the sleeve with the shaft 65. Mounted upon the sleeve within the casing at one side of the bearing 64 is a series of bevel-pinions 89 90 91 92. These pinions have their inner face formed with a groove, into which is adapted to extend the pin 87. The function of the pin 87 is for fixing the respective pinions when engaged by the pin

to the sleeve so that the said pinion will rotate with the sleeve. When the sleeve is so shifted as to cause the pin to be seated in that portion of the inner face of the sleeve 80 of larger diameter, all of the pinions will be loosely mounted upon the sleeve 85, so that the pinions will not be driven by the shaft 65. The pinion 89 is adapted to mesh with the row of teeth 68, pinion 90 with the row of teeth 69, the pinion 91 with the row of teeth 70, and the pinion 92 with the row of teeth 71. It will be evident that when the pinion 92 is fixed to the shaft 65 and sleeve 85 the motion imparted by its meshing with the row of teeth 71 will be a slow one, the speed imparted to the face-gear being greater when the pinion 91, 90, or 89 is fixed to the shaft.

The sleeve 85 is shifted by means of a sleeve 93, connected to an operating-rod 94, this sleeve being mounted upon the collar 95. The latter is secured to the sleeve 85 and is provided with the flanges 96, so that as the collar 93 is shifted through the medium of the rod 94 it will engage either flange 96 and shift the sleeve in the desired direction.

The motion of the face-gear 67 is reversed by means of pinion 97, loosely mounted upon the sleeve 85, the pinion 97 being adapted to be coupled to the shaft 65, so it will rotate therewith, by means of a clutch-sleeve 98, mounted upon the sleeve 85 and adapted to engage with the hub 99 of the pinion 97. The clutch-sleeve 98 is shifted by means of the enlarged end 100 of the sleeve 85, this end forming an abutment which engages with the end of the clutch-sleeve 98, so that when the sleeve 85 is shifted to cause the pin 87 to be free of the pinions 89 90 91 92 the enlarged portion 100 of the sleeve 85 will engage the clutch-sleeve 98 and force the same into engagement with the hub 99 of the pinion 97 and cause the latter to rotate with the sleeve 85 and shaft 65. The connection between the clutch-sleeve 98 and sleeve 85 and shaft 65 is by means of a pin 101, which is rigidly secured to the clutch-sleeve 98 and extends through a portion of the elongated slot 86 in the sleeve 85 and through the slot 102 in one end of the shaft 65. The clutch-sleeve is released by means of a spring 103, which is interposed between the pinion 97 and the inner face of the clutch-sleeve, the spring surrounding the sleeve 85. When the sleeve 85 is shifted to cause the clutch-sleeve to engage with the pinion 97, the spring 103 is compressed and remains in such position until the sleeve 85 is shifted in an opposite direction, which will release the spring, causing the same to force the clutch-sleeve from its engagement with pinion 97, consequently the pinion becoming then loosely mounted upon the sleeve 85. It will be obvious that when the pinion 97 is caused to rotate with the sleeve 85 and shaft 65 through the intervention of the clutch mechanism the pinion 97, engaging with the row of teeth 71, will reverse the motion of the face-gear, consequently imparting a different movement to the vehicle, but that when the clutch mechanism is released the pinion then being loosely mounted upon the sleeve 85 will discontinue such movement of the face-gear. The portion 83 of larger diameter of the inner face of the sleeve or collar 80, which forms a recess, is of such size that the pin 87 will not move therefrom until the clutch is released—that is to say, if the pin 87 is removed therefrom to engage the pinion 92 before the clutch is released the face-gear will become locked; but the recess is of such length that the clutch will be released from the pinion 97 before the pin engages the pinion 92. The shoulder 84, formed by that portion of the inner face of the sleeve 81 of larger diameter, engages the clutch-sleeve and prevents the same from being shifted outwardly too far by the action of the spring 103.

It is thought the many advantages of our improved mechanism for regulating the speed of motor-vehicles can be readily understood from the foregoing description, taken in connection with the accompanying drawings, and it will also be evident that we have devised a simple, novel, and inexpensive mechanism for regulating the speed of motor-vehicles or other mechanism, and while the structural embodiment of the invention as herein disclosed is what we at the present time consider the preferable one it is evident that changes, variations, and modifications may be resorted to without departing from the general spirit of the invention or sacrificing any of its advantages, and we therefore do not wish to restrict ourselves to the details of construction hereinbefore described, and as shown in the accompanying drawings, but reserve the right to make such minor changes, variations, and modifications which come properly within the scope of the protection prayed for.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a speed-regulating mechanism, a power-transmitting shaft formed of a fixed and a longitudinally-movable section, a plurality of pinions, means for supporting the pinions, means carried by the longitudinally-movable section of the power-transmitting shaft and adapted to engage with the pinions for suitably connecting them thereto, causing the rotation thereof, and means operated by the pinions for imparting movement to a vehicle.

2. In a speed-regulating mechanism, a rotatable sleeve, means for suitably supporting said sleeve, a power-transmitting shaft formed of a fixed and a longitudinally-adjustable section, said adjustable section extending in the said sleeve, operating means for said power-transmitting shaft, a plurality of pinions loosely mounted upon the said sleeve, means carried by the longitudinally-adjustable section of the power-transmitting shaft

and adapted to engage in the pinions for suitably connecting them therewith causing the operation thereof, and means engaged and operated by the pinions for imparting motion to a vehicle.

3. In a speed-regulating mechanism, the combination with a power-transmitting shaft and suitable operating mechanism therefor, of a sleeve mounted upon the said shaft, a plurality of pinions loosely mounted upon the said sleeve and adapted to be suitably connected with the said shaft, and means engaged and operated by the said pinions for imparting movement to a vehicle.

4. In a speed-regulating mechanism, a power-transmitting shaft consisting of a fixed and a longitudinally-adjustable section, operating means for said shaft, shifting means for said longitudinally-adjustable section, a sleeve mounted upon the longitudinally-adjustable section, a plurality of pinions loosely mounted upon said sleeve, means carried by the longitudinally-adjustable section and adapted to extend through the said sleeve and into the said pinions for suitably connecting them with the said shaft to cause the operation thereof, and means engaged and suitably operated by the said pinions for imparting movement to a vehicle.

5. In a speed-regulating device, a power-transmitting shaft, a sleeve mounted thereon, a suitably-mounted face-gear, a plurality of pinions mounted upon the said sleeve and adapted to engage the said gear for imparting thereto variable speed in either direction, and means for suitably connecting the pinions with the power-transmitting shaft to cause the operation of the said pinions.

6. In a speed-regulating mechanism, an adjustable power-transmitting shaft, a sleeve mounted thereon and adapted to be rotated thereby, a plurality of pinions loosely mounted upon said sleeve, means carried by the power-transmitting shaft for suitably connecting the pinions and the sleeve thereto to cause the operation of said sleeve and pinions, and a suitably-mounted face-gear adapted to be engaged by and operated at variable speed by the said pinions.

7. In a speed-regulating mechanism, a sleeve provided with a pair of diametrically opposite slots, a plurality of pinions loosely mounted upon said sleeve and provided with a pair of diametrically opposite grooves registering with the slots of the sleeve, an adjustable shaft extending within said sleeve, means carried by the shaft and extending through the slots of the sleeve and engaging in the grooves of the pinions for suitably fixing the pinions to the sleeve, means for causing the rotation of the said sleeve, shaft and pinions, and means engaged by the pinions and operated at variable speed for imparting motion to a vehicle.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

SALVATORE SCOGNAMILLO.
CHARLES H. POSNER.

Witnesses:
PASQUALE C. PASCALE,
FRANK ZUGGIERE.