T. J. KEHOE.

CHANGE OF SPEED DEVICE.

APPLICATION FILED JAN. 4, 1909.

952,529. **Patented Mar. 22, 1910.**

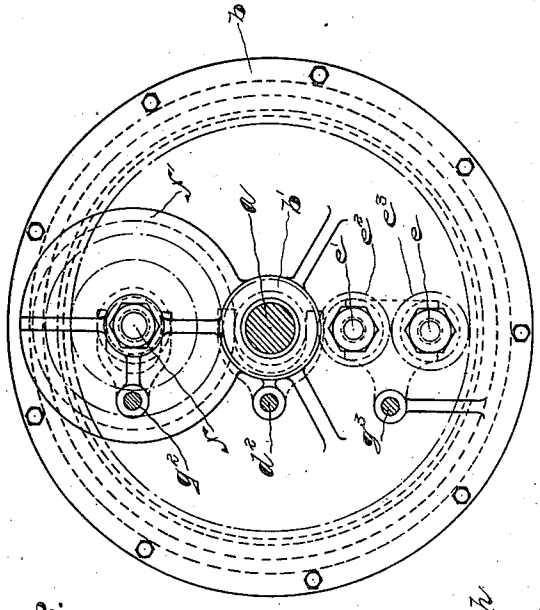

Fig. 2.

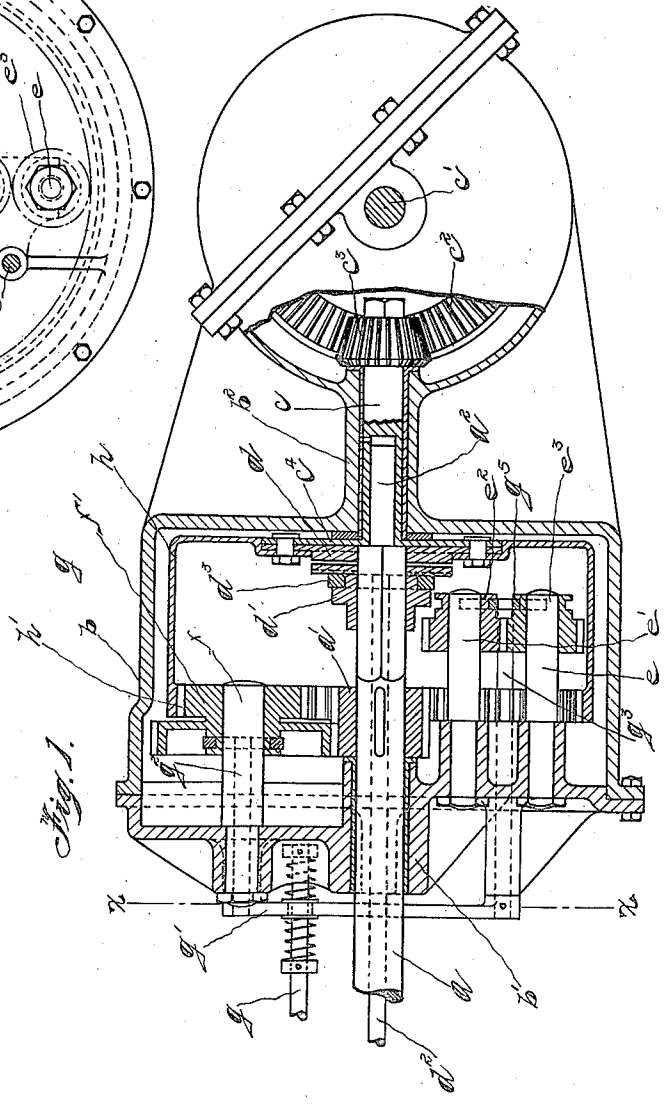

Fig. 1.

Thomas J. Kehoe

INVENTOR.

WITNESSES:

Lester L. Allen.

Arthur V. Regan

UNITED STATES PATENT OFFICE.

THOMAS J. KEHOE, OF DAYTON, OHIO.

CHANGE-OF-SPEED DEVICE.

952,529. Specification of Letters Patent. Patented Mar. 22, 1910.

Application filed January 4, 1909. Serial No. 470,649.

To all whom it may concern:

Be it known that I, THOMAS J. KEHOE, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Change-of-Speed Devices, of which the following is a specification.

My invention relates to change of speed devices particularly adapted to motor vehicles and especially for that type of vehicle which employs longitudinal driving shafts adapted to drive the axle of the vehicle by a direct connection therewith.

The object of the invention is to simplify and cheapen the construction of devices of this character and make more effective the operation thereof.

The invention consists in the constructions and combinations of parts hereinafter described and set forth in the claims.

In the accompanying drawings Figure 1 is a longitudinal sectional view of a device embodying my invention. Fig. 2 is a vertical section on the line x x of Fig. 1.

Like parts are represented by similar characters of reference in the several views.

In the device which I have illustrated, the mechanism is designed to afford two changes of speed and the reverse.

In the said drawings a represents the main driving shaft which is driven from any suitable source of power and extends rearwardly from the motor into the gear casing b, which is provided with a bearing, b^1, for said shaft. The shaft is provided at its rear end with a reduced portion, a^2, which extends into the end of the driven shaft, c, which shaft, c, is located in suitable bearings, b^2, on the gear casing and is geared to the axle, c^1, of the machine through the medium of the beveled gear and pinion, c^2 c^3.

Secured to the shaft, c, is one member, d, of a clutch, this clutch being preferably secured to the shaft by being bolted to the plate, c^4, on the end of the shaft, c. Slidingly mounted on the driving shaft, a, is the other member, d^1, of the clutch adapted to be engaged and disengaged through the medium of the rod, d^2, connected to the movable member, d^1, of the clutch by the yoke, d^3, and being connected at its opposite end to a suitable operating lever (not shown) in convenient reach of the operator. When the two shafts are thus connected, the shaft, c, will be driven at the same rate of speed as the driving shaft, a, and this constitutes the high speed.

Splined to the driving shaft, a, within the casing b, is a driving pinion, a^1. Slidingly mounted on the pins or studs, e e^1, suitably secured to the gear casing, b, and projecting therein, are two pinions, e^2 e^3 permanently in mesh. Slidingly mounted on a stud or pin, f, suitably secured to the gear casing and projecting therein on the opposite side of the casing from studs, e e^1, is a pinion f^1. The respective pinions, e^2 e^3 and f^1, are connected to an operating rod, g, which rod is connected to a cross-bar, g^1, which cross-bar has at its opposite ends rearwardly projecting rods, g^2, g^3, the rod, g^2, being connected to the pinion, f^1, through the medium of the yoke, g^4, and the rod, g^3, being connected to the pinions, e^2 e^3, through the medium of the yoke g^5. The forward end of the operating rod, g, is connected to any suitable operating lever (not shown) arranged in convenient reach of the operator.

Connected to the driven shaft, c, preferably by securing the same to the plate, c^4, at the point where the clutch member, d, is attached, is a large internal gear, h, the teeth, h^1, of which are arranged opposite the teeth of the driving pinion, a^1. The pinions, e^2 e^3, are for the low speed drive and the pinion, f^1, is for the reverse drive. The reverse drive pinion and low speed pinions are arranged in such relation with each other that the operator may, through the medium of the rod g and its connections, engage and disengage the respective pinions with the driving pinion, a^1, and the large internal gear, h, or may disengage all the pinions from the driving pinion, a^1, and the large gear, h. In the position shown in Fig. 1 the pinion, f^1, is in engagement with the driving pinion and the large gear; this pinion, f^1, being preferably in the nature of a double pinion, one set of its teeth being adapted to engage with the pinion, a^1, and the other set with the internal gear, g. By operating the rod, g, the respective pinions, f^1 e^2 e^3, may be slid forwardly on their respective studs, disengaging the reverse drive pinion and engaging the low speed pinions with the driving pinion, a^1, and large internal gear, h. Or, if desired, the respective pinions may be moved to such a point that none of them will be in engagement with the driving pinion, a^1, or the internal

gear, *h*, so that the high speed clutch may be thrown in operation or the machine may be stopped altogether.

Having thus described my invention, I claim:

1. In a change of speed device, a main driving shaft, a driven shaft, means for forming a direct driving connection between said shafts, a pinion on said driving shaft, a gear connected to said driven shaft, and an intermediate reversing pinion arranged between said driving shaft pinion and said gear, a pair of slow speed pinions also arranged between said driving shaft pinion and said gear, and means for alternately establishing a driving connection between said driving pinion and gear through the medium of said reverse and slow speed pinions, substantially as specified.

2. In a change of speed device, a driving shaft and a driven shaft, means for forming a direct driving connection between said shafts, a pinion on said driving shaft, an internal gear connected to said driven shaft, a pair of projecting studs between said driving-shaft pinion and said internal gear, meshed pinions slidingly mounted on said studs, and means for sliding said pinions on said studs to connect and disconnect said driving pinion and gear, substantially as specified.

3. In a change of speed device, a driving shaft and a driven shaft, means for forming a direct driving connection between said shafts, a pinion on said driving shaft, an internal gear connected with said driven shaft, a pair of studs between said pinion and gear, a pair of meshed intermediate pinions slidingly mounted on said studs, a single stud located between said driving pinion and said gear, a pinion slidingly mounted on said single stud, and means for sliding said pinions on said studs, substantially as specified.

In testimony whereof, I have hereunto set my hand this 30th day of December, 1908.

THOMAS J. KEHOE.

Witnesses:

E. J. WEAVER,

ANNA MAHER.