No. 697,720. Patented Apr. 15, 1902.

H. K. HOLSMAN.

AUTOMOBILE.

(Application filed July 31, 1901.)

(No Model.)

Fig. 1.

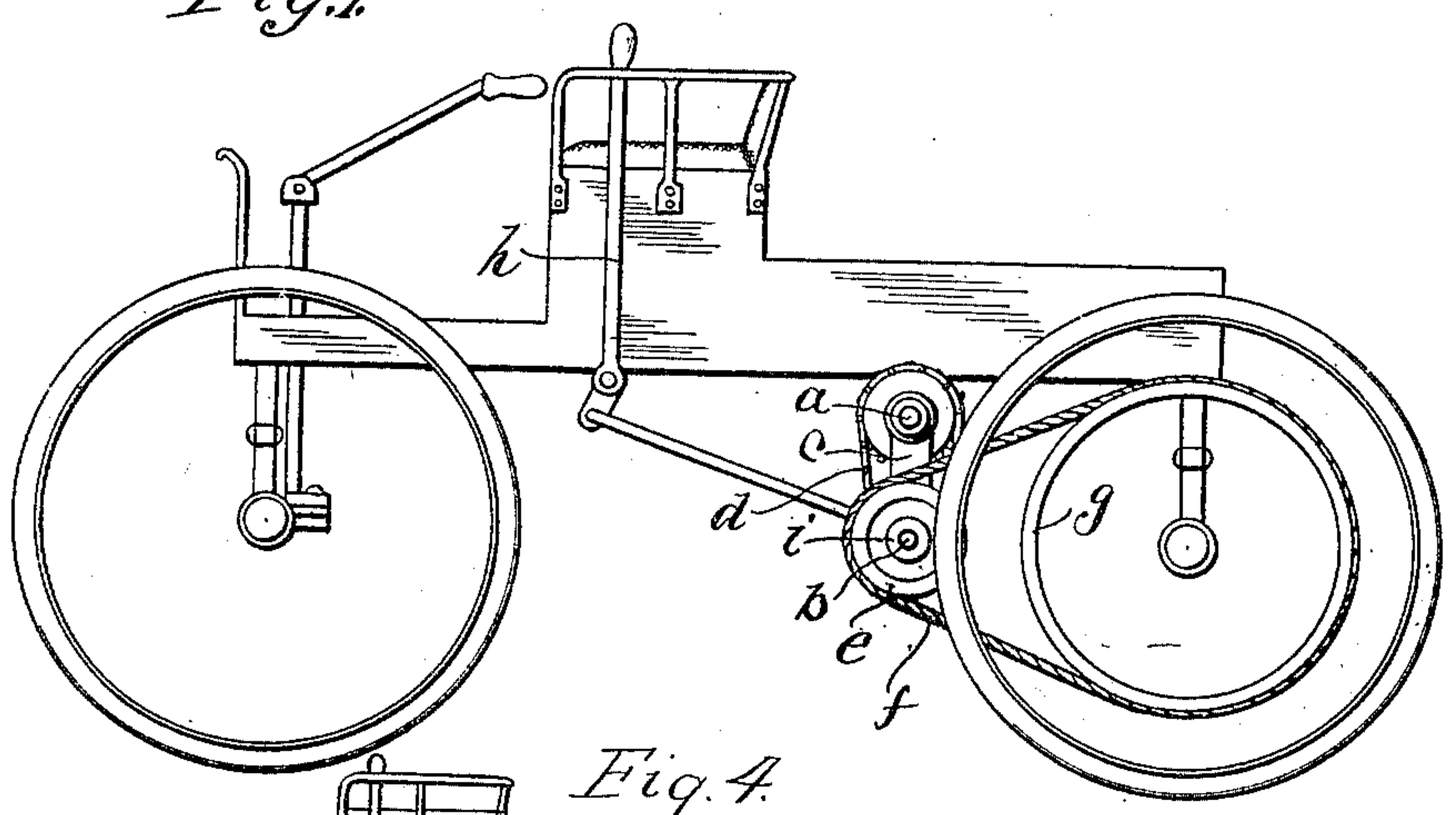


Fig. 4.

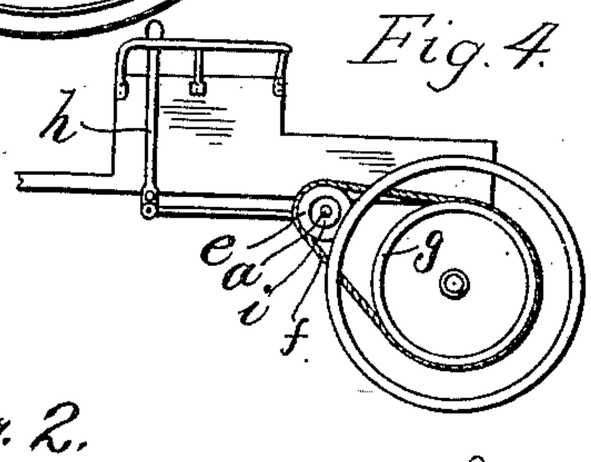


Fig. 2.

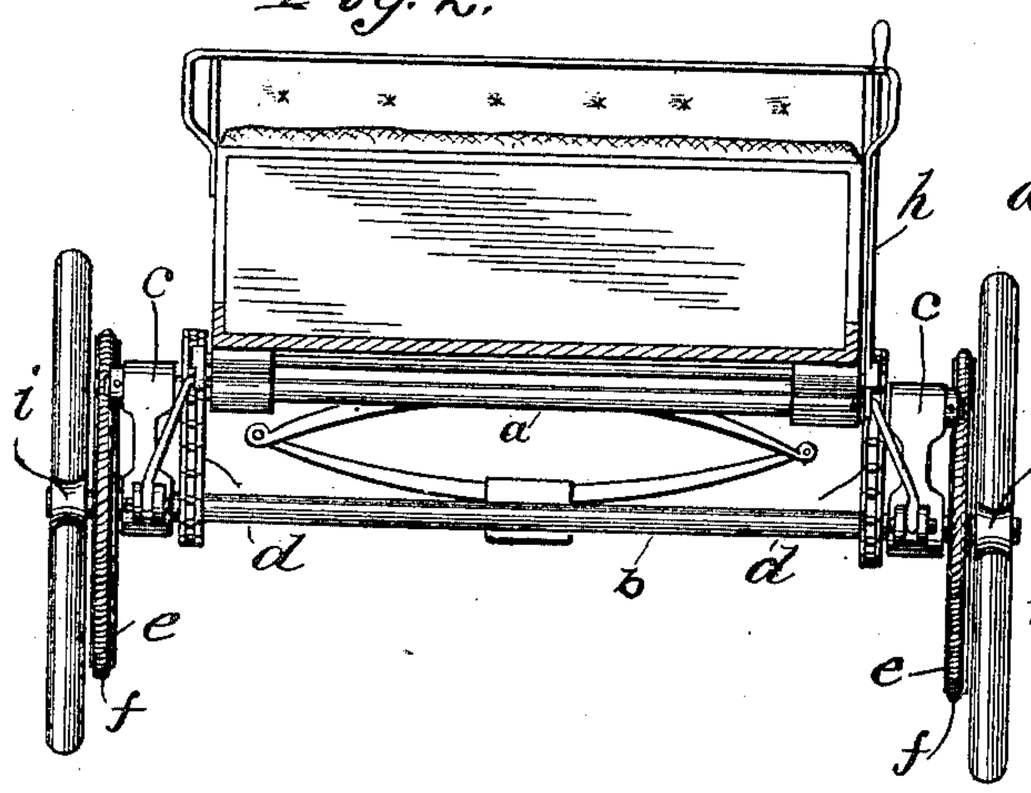
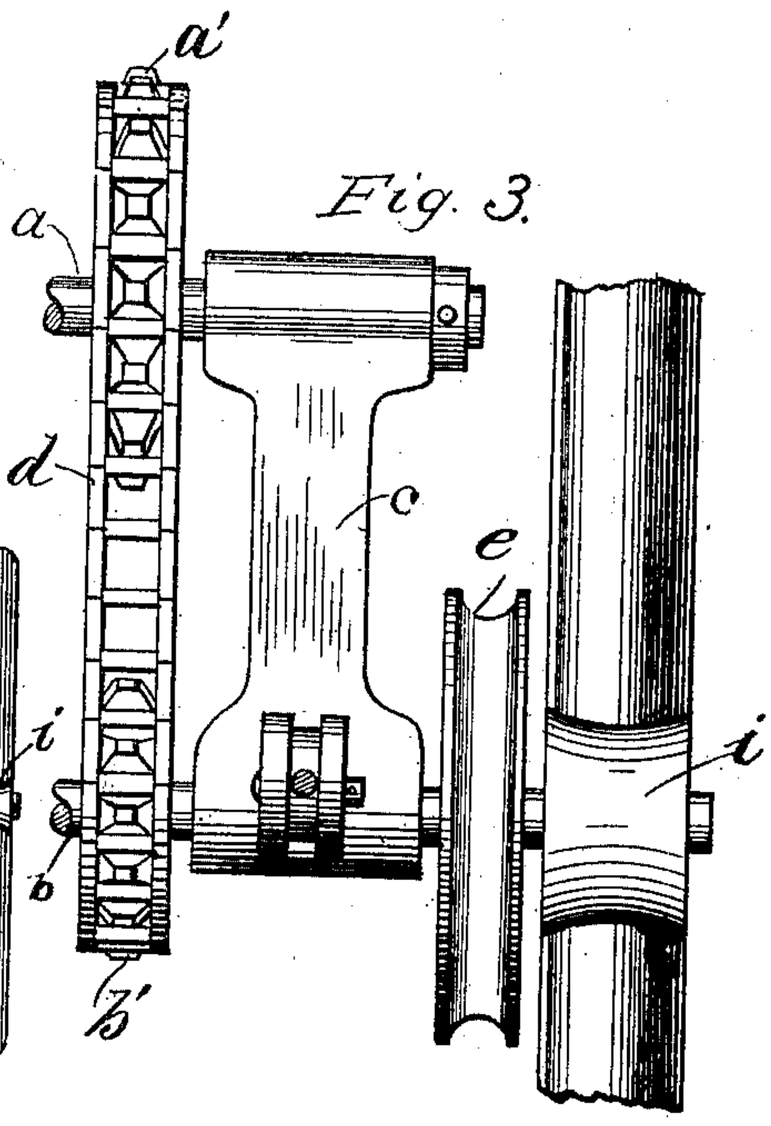


Fig. 3.



Witnesses:
R. J. Jacker.
George A. Harbaugh

Inventor:
Henry K. Holsman
By Coburn McRoberts & McElroy,
Attys.

UNITED STATES PATENT OFFICE.

HENRY K. HOLSMAN, OF CHICAGO, ILLINOIS.

AUTOMOBILE.

SPECIFICATION forming part of Letters Patent No. 697,720, dated April 15, 1902.

Application filed July 31, 1901. Serial No. 70,346. (No model.)

To all whom it may concern:

Be it known that I, HENRY K. HOLSMAN, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Automobiles, of which the following is a specification.

My invention relates to that class of apparatus employed for the purpose of transmitting power to the traction-wheels of automobiles.

The primary object of my invention is to provide power-transmitting means for automobiles of that class employing a motor that runs or operates continuously while the vehicle is in use wherein a belt or rope may be employed to drive the traction-wheels, thereby dispensing with the otherwise necessary driving-clutch and simplifying the construction and mode of operation of the parts employed.

Another object of my invention is to provide a power-transmitting device by which the car or vehicle may be driven in either direction; also, to provide a brake device so associated with the driving elements that when the power ceases to drive the traction-wheels in the forward direction the brake device will be operative.

With these objects in view my invention consists in the construction and arrangement of parts and in certain particulars of organization, as will be hereinafter first fully described and then particularly pointed out in the claims.

Referring to the accompanying drawings, which are made a part hereof, and on which similar letters of reference indicate the same or corresponding parts, Figure 1 is a side elevation of an automobile of the run-about type provided with my improvements. Fig. 2 is a sectional view of the same to more clearly show the relation of the parts. Fig. 3 is a detail view of the driving-shaft and its associated parts. Fig. 4 is a view of a modification in which the devices are mounted directly on the motor-shaft.

Referring now to Fig. 1, I have shown an automobile of any suitable design which is provided with any convenient form of constantly-running motor, preferably having a suitable driving-shaft *a* located at any suitable point and shown for convenience of illustration as extending below the ordinary seat portion thereof. Below the driving-shaft and preferably extending from side to side of the vehicle is located a suitable counter-shaft *b*, which is hung in depending hangers *c*, the arrangement and organization of the parts being such that the center of the circle in the arc of which the counter-shaft moves on these hangers is coincident with the axis of the driving-shaft, whereby a suitable driving-chain *d*, by means of which the motion of the shaft *a* is transmitted to the shaft *b* by the sprockets *a'* and *b'*, remains taut in all positions of the shaft *b* when moved in its hangers. The shaft *b* carries at each end a pulley *e*, from which a suitable band *f*, such as a belt or rope, runs to a driven pulley *g*, secured upon one of the rear traction-wheels.

The position of the shaft *b* and the movement of the hangers *c* is controlled by any suitable means extending within the reach of the operator—such, for example, as the lever *h*—whereby the band *f* is tightened or slackened at will. It is apparent that the movement of the hangers necessary to carry out this function and operation is very limited, as the distance between the driving and driven pulleys is lessened only sufficiently to release the friction between the band and driving-pulley to enable the pulley to revolve without carrying the band with it, acting, in fact, as an idle pulley.

When power is applied to the counter-shaft from the motor employed, the operator may readily start the vehicle by operating his controller, as the lever *h*, to draw the driving pulleys or wheels into position to frictionally engage their bands, whereby motion will be transmitted to the traction-wheels and the vehicle propelled in a forward direction. When it is desired to stop the vehicle, the controller is moved in the opposite direction to diminish the distance between the pulleys, whereby the band becomes slack and ceases to drive the traction-wheels, the driving-pulleys revolving as idle pulleys and the bands slipping over them.

By employing a band connection, such as a rope or belt, between the driving and driven

members I am enabled to do away with the clutch mechanism heretofore generally employed. In vehicles of this character as generally constructed the traction-wheels are driven by chains or gears coöperating with continuously-running members, in which construction a clutch of some character is employed at some point between the motor and the wheel or its shaft, whereby the parts may be thrown into and out of engagement as the machine is to be moved or stopped. The revolution of the driving sprocket-wheel, where a chain is used, or gear-wheel, where gears are employed, must entirely cease by the disengagement of the clutch members when the vehicle is at rest, as otherwise the engagement of the coöperating parts with the driven member would prevent the stopping of the vehicle. By my improved construction the rotation of the driving wheel or pulley may and does continue while the vehicle is at rest without affecting the driven or the traction wheels by reason of the slack in the driving-band, the driving-pulleys revolving under the force of the motor, but running idle or out of frictional contact with the band. I also provide an organization wherein the power-transmitting device may be employed to drive the vehicle in either direction. For this purpose when the exemplification shown in Fig. 1 is employed I arrange the parts so that the axles of the driving-pulleys shall be located in proximity to the peripheries of the traction-wheels and provide them with friction-wheels *i*, each located in the vertical plane of the wheel with which it is to coöperate. It is obvious in this organization of the parts that the vehicle will be forwardly driven by the coöperation of the pulleys and bands and that as the friction-wheels *i* are caused to revolve in the same direction as the direction of forward movement of the traction-wheels the latter may be reversely driven by forcing the friction-wheels against them. Thus a reverse movement of the controller is all that is required to change the direction of travel of the vehicle. The motor need not be reversed nor any reverse-clutch mechanism employed. It is of course understood that the reverse movement of the controller to accomplish this result is extended beyond the position to stop the vehicle entirely, and in practice the two movements will preferably be in opposite directions from a normal central position of rest. It is further apparent that the pressure of the friction-wheels *i* on the traction-wheels may be so regulated as that the former will merely act as brakes to stop the vehicle. If the friction-wheels are caused to contact with the traction-wheels when the vehicle is moving forward, they will of course have a tendency to stop the revolution of the latter, and the quickness of this operation may be varied by the amount of pressure employed and degree of contact. When the forward movement is arrested, the friction-wheels may be moved from contact with the traction-wheels as to allow the vehicle to remain at rest, or the engagement may be continued to reverse the direction of travel of the vehicle.

It is obvious that the embodiment above described is merely an exemplification of my improvements. I may dispense with the counter-shaft, hangers, &c., and provide the driving-pulleys and reversing-wheels directly on the motor-shaft or upon the driving-shaft of the motor. For example, as shown in Fig. 4, the shaft *a* carries the driving-pulleys and the combined reversing and brake disks *i*, and suitable movement is given to this shaft from the controller to perform all the functions above described in connection with the organization of Fig. 1. For this purpose the shaft may be arranged to move in ways or guides, the arrangement of parts and the connections to the engine to permit such movement being made in any well-known manner.

By employing a transmitting mechanism having a band instead of a chain I am enabled to use the ordinary carriage-wheels, which are dished somewhat outwardly. When a chain is employed or a gear coöperating with a sprocket or gear wheel respectively secured to the traction-wheel, it is necessary to employ straight wheels, as the driving and driven elements must be alined or in the same plane. For this reason it is necessary to use smaller wheels. By my invention the alinement of the pulleys is not necessary, and hence I may use the ordinary dished wheels.

It is understood that in practice each side of the vehicle is preferably provided with its appropriate driving and driven pulleys and their associated parts, the apparatus employed merely being duplicated.

Various changes in the details of construction and in the relative arrangement of the parts may be made without departing from the spirit and scope of my invention. For example, the driven pulley may be located either on the traction-wheel or upon a shaft common to either the front or rear pair of wheels. The counter-shaft may be replaced by suitable stub axles or shafts, of which one or more may be employed, but preferably one being located on each side of the vehicle. Other means for changing the relative distance between the driven and driving pulleys to cause the slackening and tightening of the band may be employed.

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

1. In an automobile, the combination with the traction-wheel mounted on a stationary axle or bearing and having a pulley-wheel thereon, of a driving-shaft mounted in bearings movable relative to the traction-wheel bearings, a driving-pulley mounted thereon, a roller-disk secured to said shaft to rotate therewith in the plane of the traction-wheel, a belt or rope connecting said pulley-wheels, means for continuously rotating the driving-shaft, and means for moving the driving-

shaft toward the traction-wheel so as to release the driving-belt and subsequently apply the roller-disk to the traction-wheel to reverse it.]

2. In an automobile, the combination with the traction-wheel mounted on a stationary axle or bearing and having a pulley-wheel thereon, of a driving-shaft having a driving pulley-wheel thereon and a reversing-disk in the plane of the traction-wheel, a belt connecting said pulley-wheels, means for driving said driving-shaft, a means for bringing the driving-shaft and traction-wheel toward each other so as to release the tension of the driving-belt and to apply the reversing-disk to the traction-wheel.

3. In an automobile, the combination with the power-shaft, of a counter-shaft having driving-pulleys thereon, hangers for the counter-shaft adapted to swing about the axis of the power-shaft, driving connections from the power-shaft to the counter-shaft, traction-wheels having driven pulleys, and a band from each driving-pulley to its associated driven pulley.

4. In an automobile, the combination of a power-shaft, a through-shaft having driving-pulleys, hangers for the through-shaft adapted to swing about the axis of the power-shaft, a chain from the power to the through shaft, traction-wheels having driven pulleys, and a band from each driving-pulley to its associated driven pulley.

5. In an automobile, in combination a driving and driven pulley having a band, a combined brake and reverse disk associated with the driving-pulley, means to move the said pulley to slack the band and cause the disk to impinge upon the traction-wheel.

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

HENRY K. HOLSMAN.

Witnesses:
GEORGE R. HARBAUGH,
J. MCROBERTS.