No. 607,443. Patented July 19, 1898.

C. LARUE.

DRIVING GEAR FOR VELOCIPEDES, AUTOCARS, OR OTHER VEHICLES.

(Application filed Aug. 3, 1897.)

(No Model.)

Fig. 1.

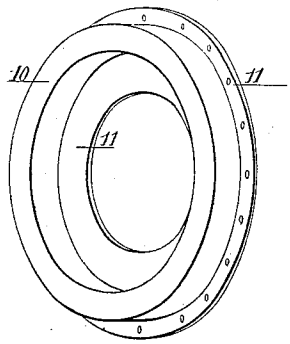


Fig. 2.

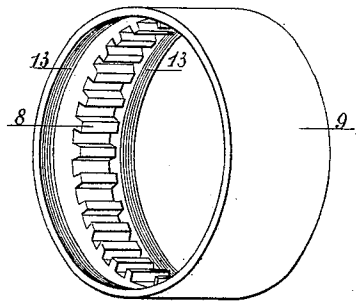


Fig. 3.

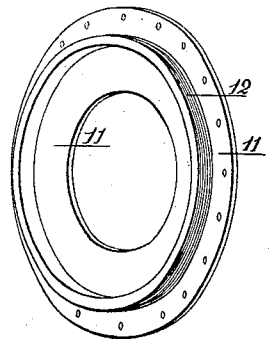


Fig. 4.

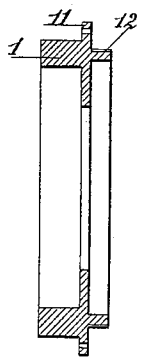


Fig. 5.

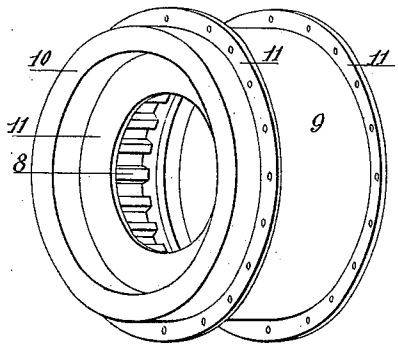


Fig. 6.

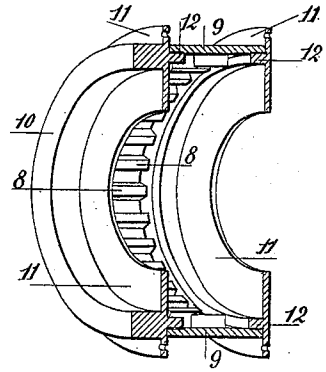


Fig. 7.

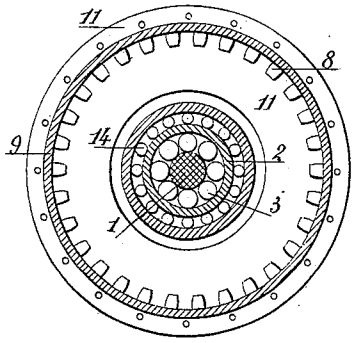


Fig. 8.

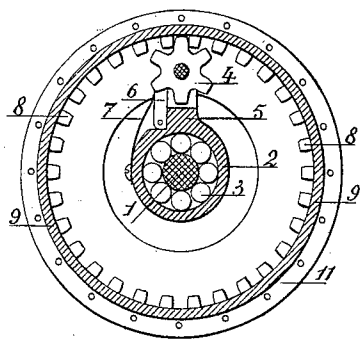
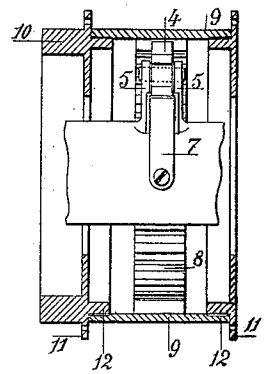


Fig. 9.



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UNITED STATES PATENT OFFICE.

CHARLES LARUE, OF BRUSSELS, BELGIUM.

DRIVING-GEAR FOR VELOCIPEDES, AUTOCARS, OR OTHER VEHICLES.

SPECIFICATION forming part of Letters Patent No. 607,443, dated July 19, 1898.

Application filed August 3, 1897. Serial No. 646,925. (No model.) Patented in Belgium May 31, 1897, No. 128,585; in England July 16, 1897, No. 16,865; in France July 21, 1897, No. 268,955; in Italy September 30, 1897, No. 33/45,667; in Austria October 14, 1897, No. 24,659, and in Hungary January 25, 1898, No. 10,690.

To all whom it may concern:

Be it known that I, CHARLES LARUE, a citizen of France, residing at Brussels, Belgium, have invented certain new and useful Improvements in Driving-Gear for Velocipedes, Autocars, or other Vehicles, (for which Letters Patent have been obtained in the following countries: Belgium, No. 128,585, dated May 31, 1897, and certificate of addition thereto, No. 129,366, dated July 8, 1897; France, No. 268,955, dated July 21, 1897; Great Britain, No. 16,865, dated July 16, 1897; Austria, No. 24,659, dated October 14, 1897; Hungary, No. 10,690, dated January 25, 1898, and Italy, No. 33/45,667, dated September 30, 1897;) and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to figures of reference marked thereon, which form a part of this specification.

The object of the present invention is the production of an improved arrangement of intermediate or transmission gear between the mechanical transmission means and the elements of propulsion, with a view, first, to give to the vehicle when these means are in motion a greater speed to that which it would acquire by the normal working of the said means if the improved arrangement were not applied to it, and, second, the mechanical transmission means being at rest to utilize the momentum acquired.

The accompanying drawings represent an apparatus to be applied to a bicycle, the size of which varies according to the dimensions and the weight of the vehicle.

In order to render the description as clear as possible, I will suppose that the new arrangement is applied to a chain-driven bicycle. It is, however, to be understood that it may be equally well applied to a machine or vehicle driven by bevel-gearing, &c.

In the accompanying drawings, which represent the various parts of my invention, Figures 1, 2, and 3 are perspective views, and Fig. 4 is a vertical section, illustrating the various elements of a drum made of metal or other suitable material intended to inclose the mechanical parts of the new arrangement. Fig. 5 shows these parts fitted together. Fig. 6 is a vertical transverse section of the drum seen in perspective and shows a ring of teeth on the interior of the said drum. Fig. 7 is a vertical section showing how the drum is mounted on the hub of the bicycle-wheel. Fig. 8 is a vertical section showing the mechanical parts between the hub and the drum. Fig. 9 is a transverse section corresponding to Fig. 8.

In all the figures the same reference-numbers indicate the same parts.

1 is the fixed axle of the back wheel of a bicycle, on which the hub 2 of this wheel rotates by the interposition of balls 3, as in the ordinary construction. On this hub is mounted the small toothed pinion, which through the chain is in connection with the large pinion on the crank-axle. Contrary to what has hitherto existed in bicycles, the felly of the wheel is not directly connected to this hub. There exists between the said wheel and this hub an intermediary, which constitutes the object of my invention and has for its object to solve the problem stated at the commencement of this description. This intermediary comprises a small toothed wheel 4, held between the two cheeks 5 of a fork fixed to or cast with the hub 2, and between which it can turn freely whether mounted on an ordinary axle or on balls. A pawl 6, mounted on the hub, is held in contact with the toothed pinion 4 by the pressure of the spring 7. As will be understood, the pawl 6 prevents the toothed pinion 4 from rotating from right to left. The pinion 4 gears with the teeth 8, cast or fixed on the inside of a drum 9. This drum has two ends, shown as separate pieces in Figs. 1, 3, and 4 and mounted on the "drum" 9, properly called. (Shown in Figs. 5 to 9, inclusive.) One or both of these ends carries a ring 10 on the cheeks 11, which latter are perforated around their exterior circumference to receive the spokes of the bicycle-wheel, as in the ordinary hub. 12 represents an externally-screw-threaded ring to engage with the internally-screw-threaded part 13 of the drum 9. Around the axis the cheeks 11 are pierced to permit the

passage of the hub 2. The drum will revolve on the hub by the intermediary of a series of balls 14. The balls 14, like the balls 3, run between cones and cups. I have not thought it necessary to show completely the well-known arrangement of these bearings, as they do not constitute an essential element of my invention.

After having described the different parts of my invention I will now describe the operation of this apparatus and how it fulfils the conditions mentioned above. The bicyclist in driving the cranks drives the small toothed pinion, and with it the hub 2. This in its turn drives the drum 9 by the intermediary of the small toothed pinion 4, which in so doing acts as a pawl, engaging in the teeth of the ring 8. The drum 9 drives the felly, with which it is connected by the spokes which unite these two parts. By my arrangement the first desideratum is solved, because the greater angular speed of the felly at a given moment is not reduced by the lesser speed of the hub, because these elements are not united rigidly. The drum passes freely around the hub, causing the small toothed pinion 4 to turn from left to right, which pinion is not relatively at rest except at the moment when the cyclist drives the cranks. The second desideratum is fulfilled in the same way, as during the time of rest of the cranks the back wheel and drum 9 can revolve, which causes the small pinion 4 to turn in a stationary position from left to right.

As in my invention the stoppage of the machine cannot be effected by the pedals, the bicycle should be fitted with a brake, such as those ordinarily employed, or which might be arranged to act alone or supplementarily on the ring 10, the surface of which may be smooth, rough, or notched, if necessary, according to whether the brake should act by pressure, friction, or wedging.

I claim—

In combination, a non-revoluble axle, a driving-sleeve revoluble thereon, a wheel-hub composed of the internally-toothed sleeve 9, and the flanged heads 10 and 11, the pinion 4 journaled in bearings on the driving-sleeve and gearing with the internal teeth of the wheel-hub, the spring-controlled pawl 6 pivoted to the said sleeve and held in engagement with the pinion, and ball-bearings interposed between the non-revoluble axle and the driving-sleeve and between the latter and the wheel-hub, for the purpose set forth.

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

CHARLES LARUE.

Witnesses:
C. ROZER,
GREGORY PHELAN.