No. 701,533. Patented June 3, 1902.

C. C. BRAMWELL.

DRIVING MECHANISM FOR MOTOR VEHICLES.

(Application filed Sept. 14, 1899.)

(No Model.)

Fig. 1.

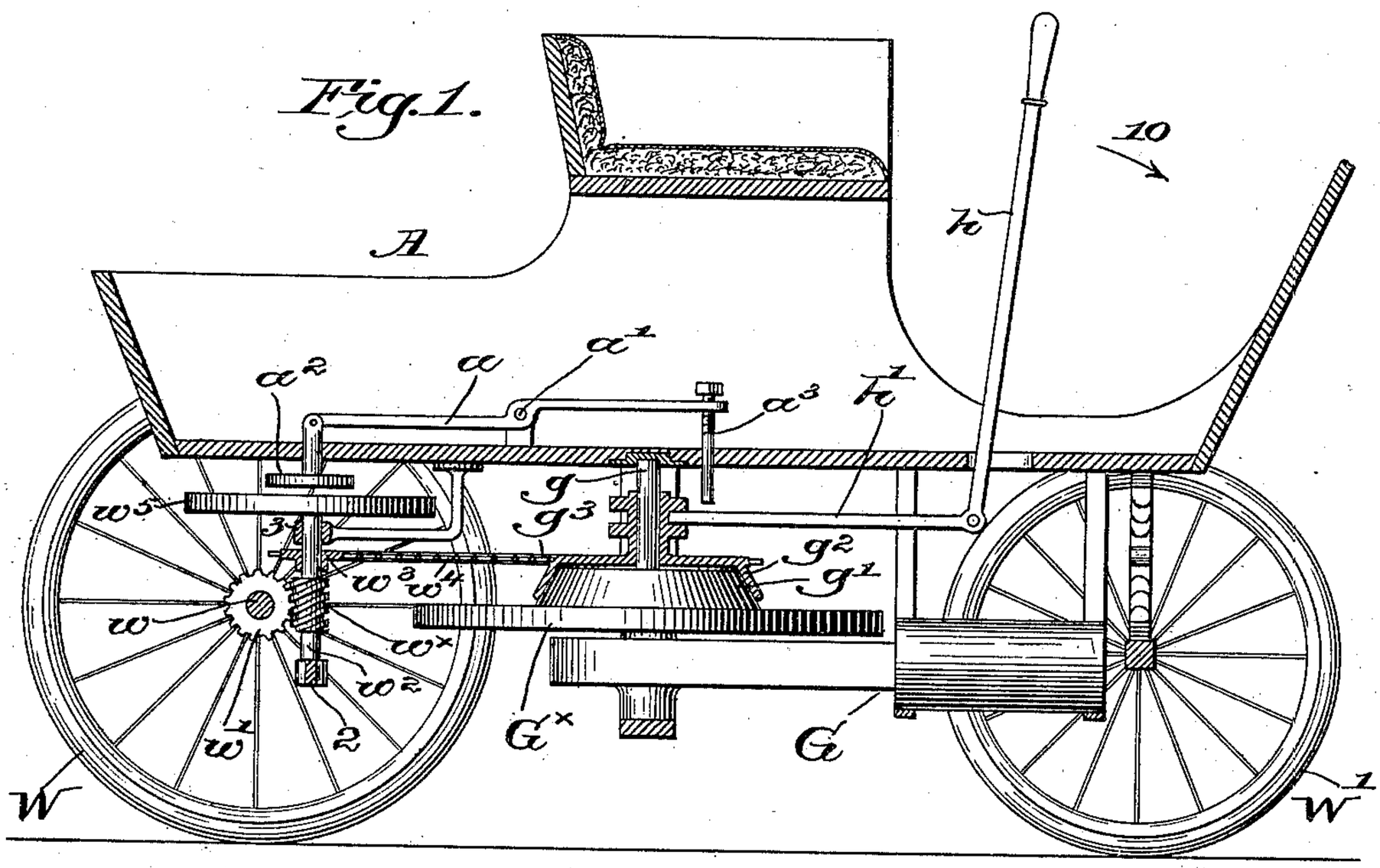
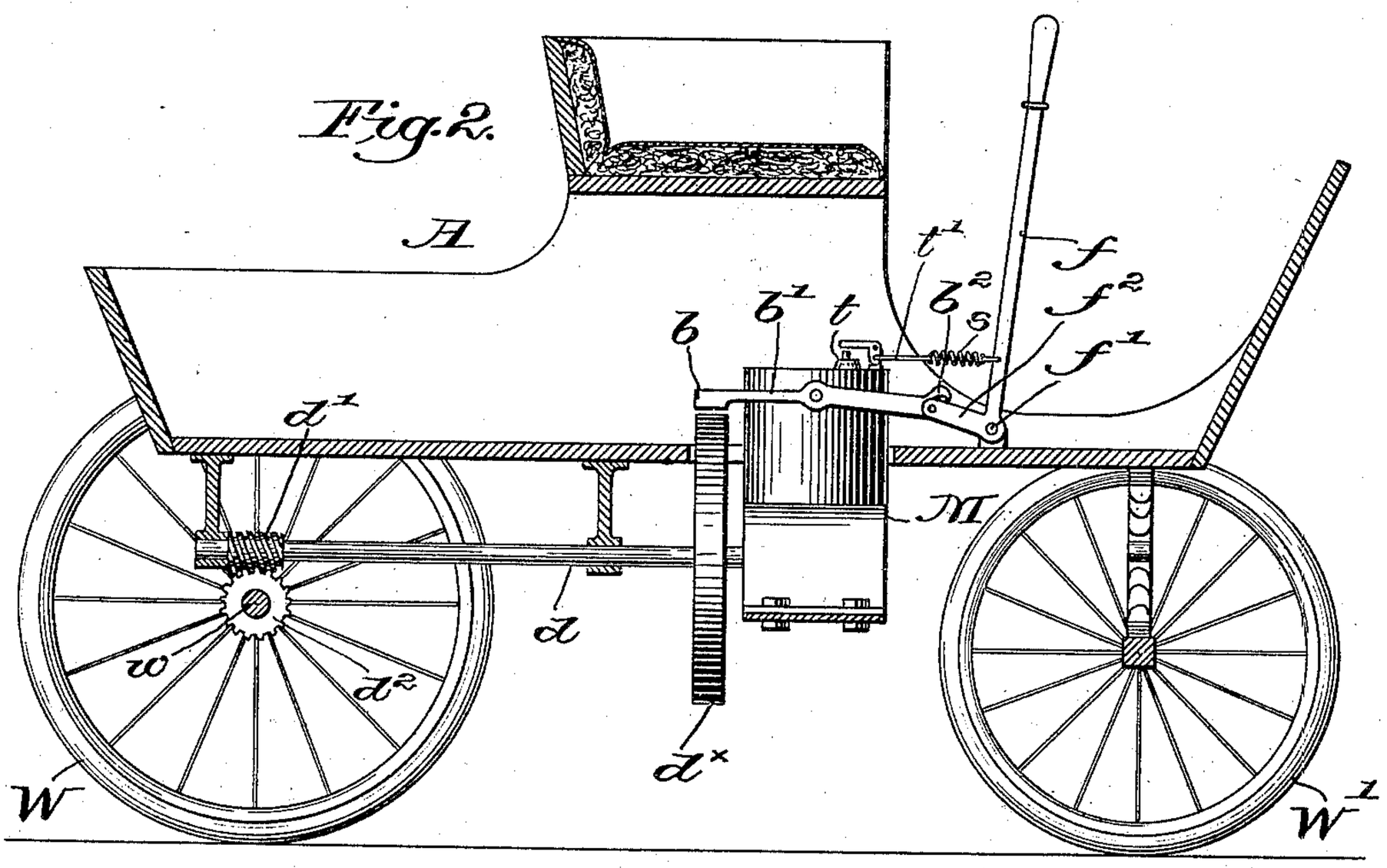


Fig. 2.



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UNITED STATES PATENT OFFICE.

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DRIVING MECHANISM FOR MOTOR-VEHICLES.

SPECIFICATION forming part of Letters Patent No. 701,533, dated June 3, 1902.

Application filed September 14, 1899. Serial No. 730,401. (No model.)

To all whom it may concern:

Be it known that I, CLARENCE C. BRAMWELL, of Hydepark, county of Norfolk, State of Massachusetts, have invented an Improvement in Driving Mechanism, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention has for its object the production of novel driving mechanism applicable to motor-vehicle and other apparatus, although, as will appear hereinafter, it is particularly adapted for use in motor-vehicles.

It is well known that while power can be transmitted through a worm to a meshing worm-gear the device is locked from operation when the worm ceases to act as the prime mover, and such a device has been applied to a motor-vehicle, the worm being movable into or out of mesh with the worm-gear. This arrangement was due to the necessity of uncoupling prior to shutting off power in order that the locking action, which operates instantaneously, should not bring the vehicle to such a sudden stop as to throw the occupants out, and the main objections to such construction are twofold. In the first place motor-vehicles are frequently manned by unskilled persons, and should the power be shut off before uncoupling the worm and worm-gear an accident will be almost inevitable either to the occupant of the vehicle or to the mechanism. In the second place, in hill-climbing by a succession of short runs the locking action is highly desirable when the vehicle is stopped; but it cannot be utilized in the mechanism referred to, owing to the necessary uncoupling of worm and worm-gear at each stop. At present there is constant danger of accident both in ascending and descending hills, for in the former case if the spark fails, a sprocket-chain breaks, a steam-pipe ruptures, &c., the carriage will immediately run backward and the band-brake very generally employed will not hold against a backward strain, and the result is usually a serious accident. With my invention the driver is completely at ease as to that feature and does not have to be constantly on the watch for an accident. Of course the steeper the hill the greater is the liability of accident, as the working parts are subjected to greater strain. In descending hills my invention prevents the custom of coasting, in which the motor is disconnected when the top of the hill is reached, and the vehicle rushes down controlled solely by the brake, and a slight unforeseen circumstance can readily cause a smash-up and serious injury and even loss of life. In my present invention I have overcome these objectionable features while retaining all the desirable functions of the worm and worm-gear in a driving mechanism, so that when the same is applied to a motor-vehicle I can utilize the locking action, readily ascend or descend steep grades, and bring the vehicle to a stop when desired without danger of accident, even when in unskilled hands.

My invention is herein shown as embodied in a motor-vehicle as a practical application thereof; but it is to be understood that my invention is in no way limited to such application or use.

Figure 1 is a longitudinal sectional view of a sufficient portion of a motor-vehicle to be understood with one embodiment of my invention applied thereto, and Fig. 2 is a similar view showing another form of my invention.

Referring first to Fig. 1, the vehicle-body A, provided with suitable wheels W W′, may be of any suitable construction, said vehicle being herein shown as provided with a gasolene-motor G, the driving-shaft g thereof being rigidly connected with one member, as g', of a suitable clutch, the other member g^2 of the clutch being loose on the shaft and controlled in any suitable manner—as, for instance, by bell-crank lever $h\,h'$—the controlling device being so located as to be easily reached by the occupant of the vehicle. The driving-wheel shaft w is shown as having rigidly attached thereto a worm-gear w', which is in continuous mesh with a worm $w\,x$ on a shaft w^2, herein shown as supported in an upright position in suitable bearings 2 3, the shaft and worm constituting a part of the transmitting means between the prime mover or motor G and the driving wheel or wheels W, the latter, which serve to propel the vehicle, being suitably attached to the shaft w, a sprocket-wheel w^3, fast on the worm-shaft, being shown as connected by a sprocket-chain

w^4 with a sprocket-gear g^3 on the clutch member g^2. The shaft g of the motor is shown as provided with the usual fly-wheel $G^\times$, common in gasolene-motors or the like, and on the worm-shaft I have rigidly connected a momentum member or fly-wheel w^5 to rotate with the worm. When the clutch is operative, the rotary movements of the motor-driving shaft will be transmitted through the intermediate connection to rotate the worm and through the latter and the worm-gear w' to actuate the driven member—namely, the wheel or wheels W. If now the power is shut off, as in the present instances of my invention, by unclutching, it will be manifest that the momentum of the member w^5 will continue the rotations of the worm-shaft for a short time, dependent upon the resistance offered, so that the worm, and consequently the parts actuated thereby, will gradually come to a stop, and when stopped the vehicle will be locked from movement either forward or backward, except through opposite rotations of the worm. Suppose the vehicle to be ascending a steep grade, it is common practice to accomplish the climb by a series of short runs, and it will be seen that with the worm and worm-gear always in mesh, as in my invention, the locking action to prevent retrograde movements of the vehicle will take place instantly upon the stoppage of the worm; but the latter, it will be remembered, cannot stop suddenly, owing to the action of the connected momentum member w^5. In descending grades it will be impossible for the vehicle to run away, as the worm-gear cannot overrun, as it were, the worm, and by shutting off the power the vehicle can be brought to a stop very promptly solely through the locking action when the worm has ceased to rotate.

It will be seen from the construction hereinbefore described that no attention is paid by the operator to the transmitting mechanism itself, as all that is necessary is to turn the power on or off, according to circumstances.

It is sometimes desirable to apply a brake after shutting off the power, and I have herein shown a convenient form of brake mechanism, a lever a, pivoted at a', carrying at one end a brake-shoe a^2 to coöperate with the momentum member w^5, the other end of the lever having an adjustable stud a^3, adapted to be engaged by the arm h' of the controlling device when the latter is moved to shut off the power—that is, to discontinue the prime mover and the power-transmitting mechanism. By a continued movement of the arm a in the direction of the arrow after discontinuing the power the brake can be applied.

In Fig. 2 I have shown another embodiment of my invention, it being supposed that the motor M in this instance is a steam or other expansive fluid matter controlled by means of a suitable throttle, the power-transmitting connection between the motor and the shaft w and the driving wheel or wheels W comprising a motor-shaft d, having a worm d', in mesh with a worm-gear d^2, fast on the shaft w, and momentum member $d^\times$ being secured to the shaft d to rotate with the worm. The power is controlled by or through a suitable spring-opened throttle t, which is governed by a controlling member f, shown as a lever pivoted to the vehicle-body at f' and connected with the throttle through a link t' and spring s. A brake-shoe b, adapted to coöperate with the momentum member d, is mounted on a lever b', suitably connected, as by a slot-and-pin connection b^2, with the short arm f^2 of the controller f, so that by movement of the latter farther than is necessary to shut off the power the spring s will give, and the brake can be applied. Manifestly the operation of the driving mechanism, including the worm and worm-gear, is the same in the construction shown in Fig. 2 as has been described for a construction shown in Fig. 1, only in the construction shown in Fig. 2 the power is controlled in a different manner, owing to the difference in the form of motor illustrated.

Any form of prime mover or motor may be used in connection with my invention without departing from the spirit and scope thereof, as the gist of my invention resides in the combination of a momentum motor or equalizer with a worm in driving mechanism.

From the foregoing description it will be understood that without the momentum member it would be impossible to shut off or discontinue the prime mover from the member to be driven without bringing into play instantly the well-known locking action of a worm and meshing worm-gear.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

In a motor-vehicle, a driving wheel or wheels, a motor, intermediate power-transmitting means, including a worm and meshing worm-gear, a fly-wheel rotatable with the worm, a brake for said fly-wheel, controlling means for the motor, and actuating connections between said means and the brake, to govern the latter.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CLARENCE C. BRAMWELL.

Witnesses:

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