

No. 690,830.

Patented Jan. 7, 1902.

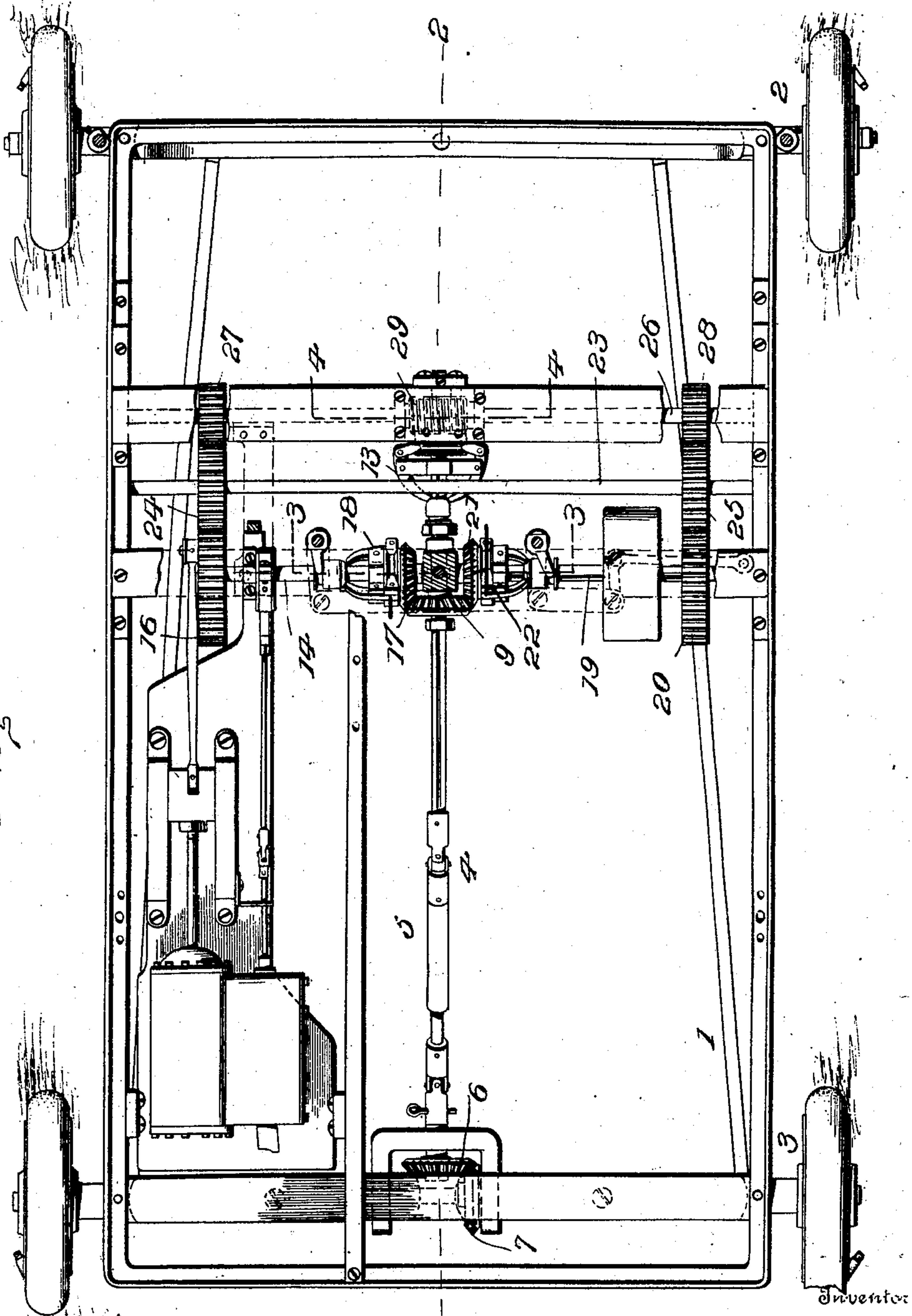
W. J. BURT.
MOTOR VEHICLE.

(Application filed June 22, 1901.)

(No Model.)

2 Sheets—Sheet 1.

FIG. 1.



Witnesses

John H. Burt
Charles L. Burt

William J. Burt

By

John H. Burt
Attorney

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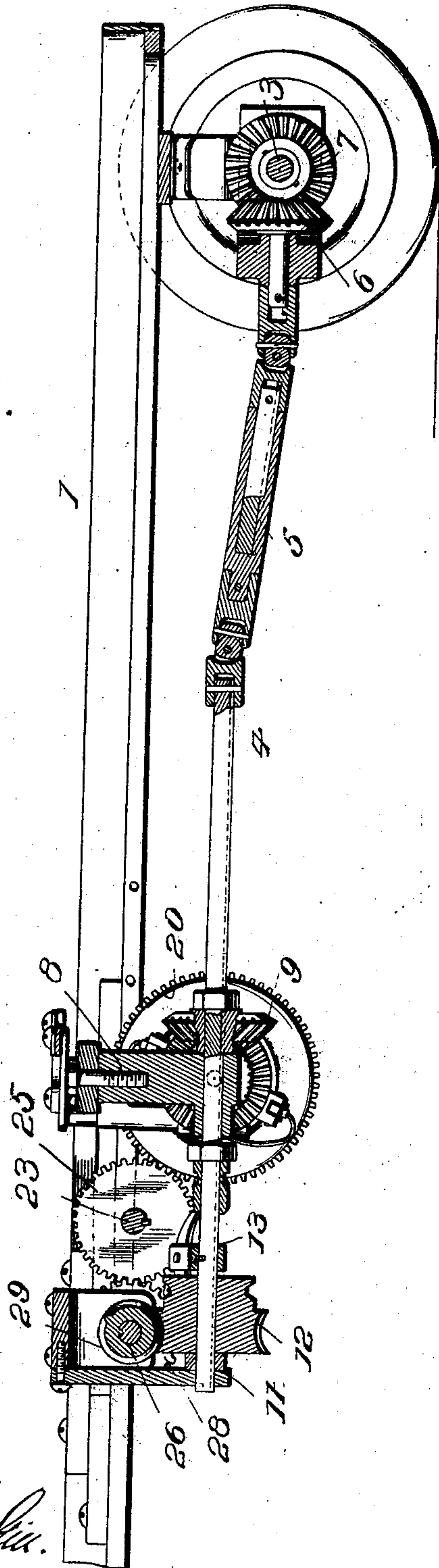
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2 Sheets—Sheet 2.

Fig. 2.



Witnesses
J. M. M. M.
C. L. M. M.

Fig. 4.

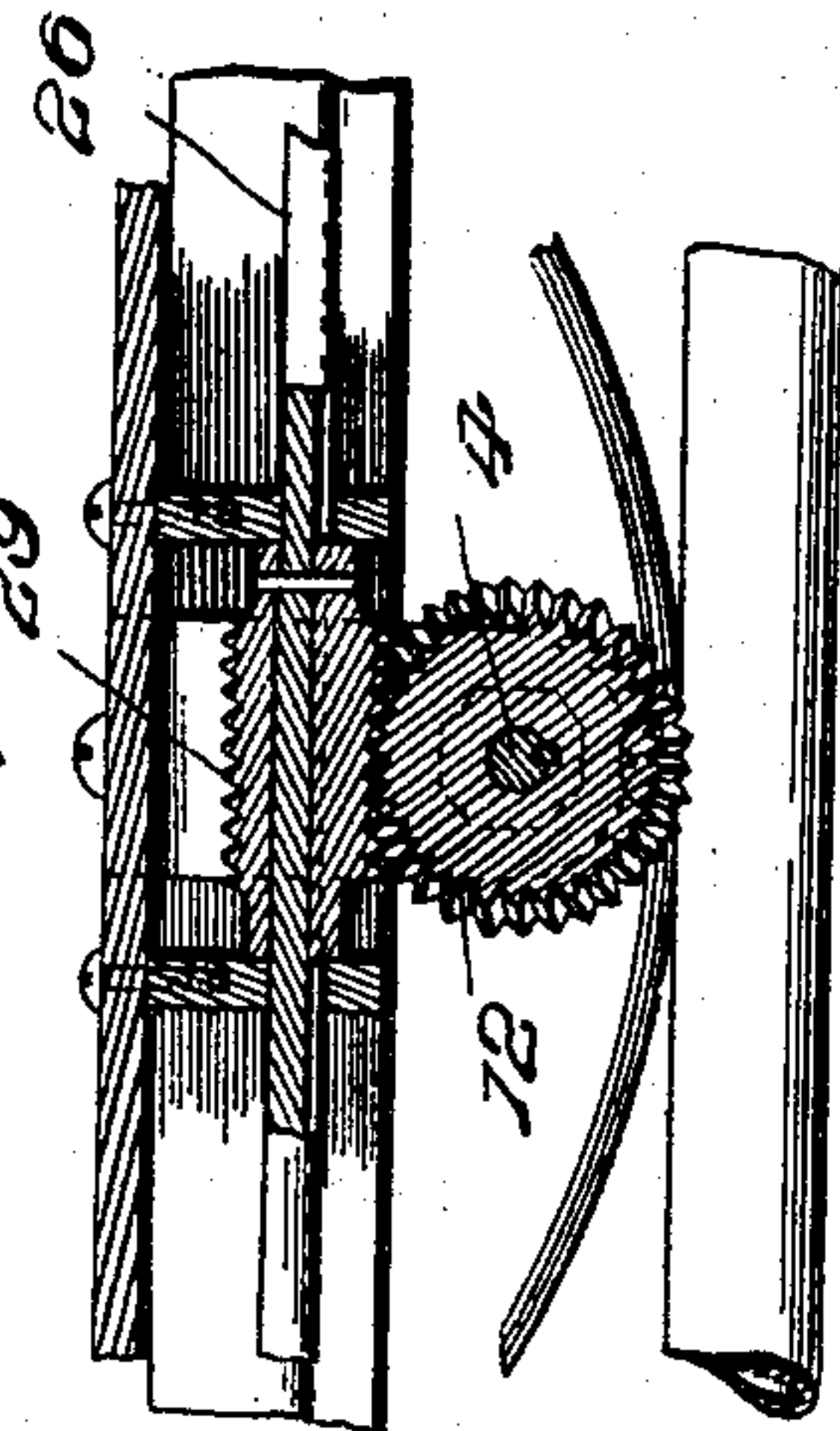
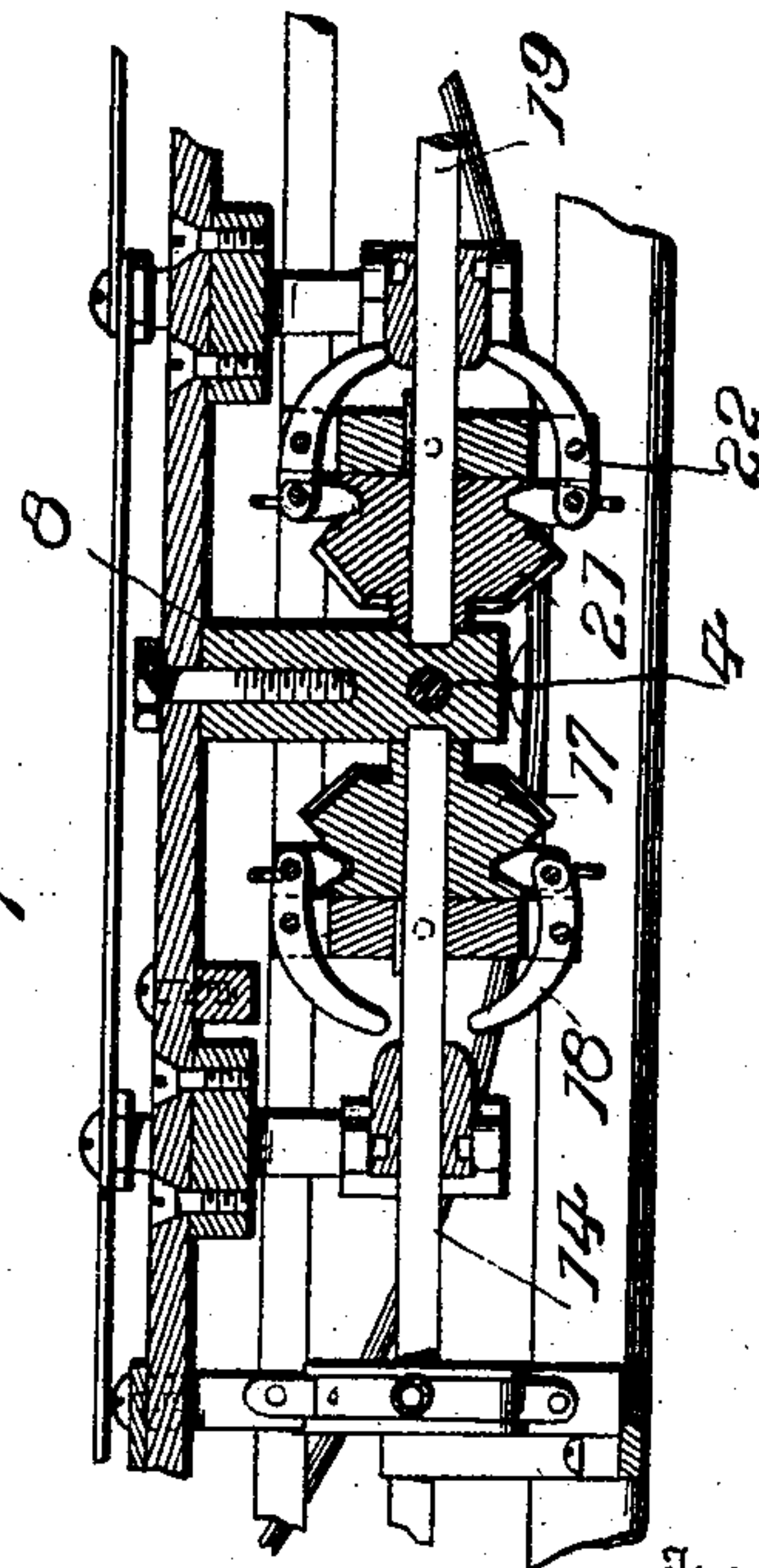


Fig. 3.



Inventor
William J. Burt

By *[Signature]* Attorney

UNITED STATES PATENT OFFICE.

WILLIAM J. BURT, OF NILES, OHIO, ASSIGNOR OF ONE-FOURTH TO WM. H. SMILEY, OF NILES, OHIO.

MOTOR-VEHICLE.

SPECIFICATION forming part of Letters Patent No. 690,830, dated January 7, 1902

Application filed June 22, 1901. Serial No. 65,636. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM JAMES BURT, of Niles, in the county of Trumbull and State of Ohio, have invented certain new and useful

Improvements in Motor-Vehicles; 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.

This invention relates to motor-vehicles.

The objects are to provide improved means for effectively operating and reversing a motor-vehicle and to provide an auxiliary driving mechanism for use under such conditions as render inadequate the ordinary mechanism for transmission of the power.

The invention will be hereinafter fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view. Fig. 2 is a longitudinal sectional view on line 2 2, Fig. 1. Figs. 3 and 4 are cross-sectional views on lines 3 3 and 4 4, respectively, Fig. 1.

Referring to the drawings, 1 designates a truck-frame having front and rear axles 2 and 3, the latter, as usual in this class of machines, being operated by the driving mechanism and the former provided with steering means of any preferred construction.

4 designates an elongated driving-shaft having a universal joint at each end of an interposed telescoping section 5 to allow of sufficient play in the springing movements of the vehicle. At its rear end this shaft has a beveled gear-wheel 6, which meshes with a beveled gear-wheel 7 of axle 3, wheel 7 being in practice secured to the differential.

On shaft 4, adjacent to a bearing 8, is a driving-cone 9, and beyond this, at its forward end, the shaft works in boxing 11. Also on this shaft are a gear-wheel 12 and a friction-clutch 13, under the control of the operator.

14 designates the cranked operating-shaft, journaled at its inner end in bearing 8. On this shaft is a gear-wheel 16 and a beveled gear 17, which latter may be thrown into and out of engagement with the driving-cone 9 by a clutch 18. The actuation of shaft 14 may be effected by any preferred motor.

19 is a reversing-shaft. It is in axial line

with shaft 14, and correspondingly mounted.

It has a gear-wheel 20 and a beveled gear 21, a clutch 22 controlling the engagement of the latter with the driving-cone 9. The clutches 18 and 22 are simultaneously operated by suitable mechanism under the control of the operator.

23 is a shaft extending transversely of the truck-frame, paralleling the forward and reverse actuating-shafts. On it are gear-wheels 24 25, in constant mesh with gear-wheels 16 and 20, respectively.

26 designates a shaft adjacent to shaft 23 and provided with pinions 27 28, meshing, respectively, with gear-wheels 24 25. At the center of this shaft is a worm-gear 29, with which engages gear-wheel 12 of driving-shaft 4.

In operation under normal conditions—that is, on level ground or when a high speed is desired—the rotation of the operating-shaft 14 is communicated through its beveled gear 17 and cone 9 to the driving-shaft 4, effecting a forward movement of the vehicle through the intermeshing gears 6 and 7. It will be noted that during this operation the rotation of shaft 14 causes the rotation also of shafts 19, 23, and 26, their respective gear-wheels being constantly in mesh, but clutches 22 and 13 being thrown out the power imparted to the driving-shaft 4 is direct from the operating-shaft 14. To reverse the machine, the clutch 18 of the operating-shaft is thrown out and clutch 22 of the reversing-shaft 19 is thrown in, placing its beveled gear in mesh with the driving-cone. The power of the operating-shaft is then communicated to shaft 19 through shaft 23.

The auxiliary driving mechanism is employed in climbing hills and carrying heavy loads, since under these circumstances the mechanism by which a machine is readily started and driven at a high rate of speed is inadequate. The shaft 26, as described, is constantly rotated through the engagement of its pinions 27 28 with gear-wheels 24 25. When the slow gear is to be employed, clutches 18 and 22 of shafts 14 and 19 are thrown out and clutch 13 is thrown in, the rotation of shaft 4 being then derived direct from shaft 26 by the intermeshing of the worm-gear. It is obvious that by reversing

the worm on shaft 26 the intermediate shaft 23 may be omitted.

The advantages of my invention are apparent. It will be seen that the means employed for operating a motor-vehicle forward, backward, in hill climbing, and under heavy loads is simple and highly efficient and that the several shafts by which this is accomplished are in constant gear, but only one shaft at a time will act upon the driving-shaft.

I claim as my invention—

1. The combination, in a motor-vehicle, with the driving-shaft, of a constantly-rotated operating-shaft, gearing between said shafts, a clutch therefor, a reversing-shaft, gearing between the latter and said driving-shaft, a clutch therefor, and a shaft constantly rotated by said operating-shaft and in turn constantly actuating the reversing-shaft, substantially as set forth.

2. The combination, in a motor-vehicle, with the driving-shaft, of a shaft for operating the same to propel the vehicle in one direction, gearing between said shafts, a clutch therefor, a second shaft for rotating the driving-shaft to propel the vehicle in the opposite direction, gearing between said second shaft and the driving-shaft, a clutch therefor, gear-wheels on said operating and second shafts, and a shaft having gear-wheels in mesh with said former gear-wheels, said latter shaft being constantly operated by said operating-shaft, substantially as set forth.

3. The combination, in a motor-vehicle, with the driving-shaft, means for operating the same, to propel the vehicle forward, and means for reversing such shaft, of an independent shaft for operating the driving-shaft under a slow gear when said operating and reversing means are not directly acting thereon, substantially as set forth.

4. In a motor-vehicle, the combination with

the driving-shaft, and the operating and reversing shafts, of a shaft driven by said operating-shaft, and means actuated thereby for rotating said driving-shaft when said operating and reversing shafts are out of engagement therewith, substantially as set forth.

5. In a motor-vehicle, the combination with the driving-shaft, the driving-cone and the gear-wheel thereon, and the operating-shaft having a beveled gear meshing with said driving-cone, a reversing-shaft driven by said operating-shaft and having a beveled gear designed to mesh with said driving-cone, of a shaft also driven by said operating-shaft having a worm meshing with said gear-wheel of the driving-shaft for actuating the latter when the gears of said operating-shaft and reversing-shaft are out of engagement with said driving-cone, and clutches controlling the respective engagements, as set forth.

6. In a motor-vehicle, the combination with the longitudinally-disposed driving-shaft for directly actuating one axle, the driving-cone and gear-wheel on said shaft, and the operating-shaft arranged transversely to said driving-shaft, a beveled gear on said operating-shaft designed to engage said driving-cone, a reversing-shaft in axial line with said operating-shaft, and a beveled gear on said reversing-shaft, of a shaft actuated by said operating-shaft, a worm thereon meshing with the gear-wheel of said driving-shaft, gearing connecting said operating-shaft to the reversing-shaft and also to the worm-gear shaft, and clutches controlling the several gears, substantially as set forth.

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

WILLIAM J. BURT.

Witnesses:

JEAN KILPATRICK,
W. H. SMILEY.