

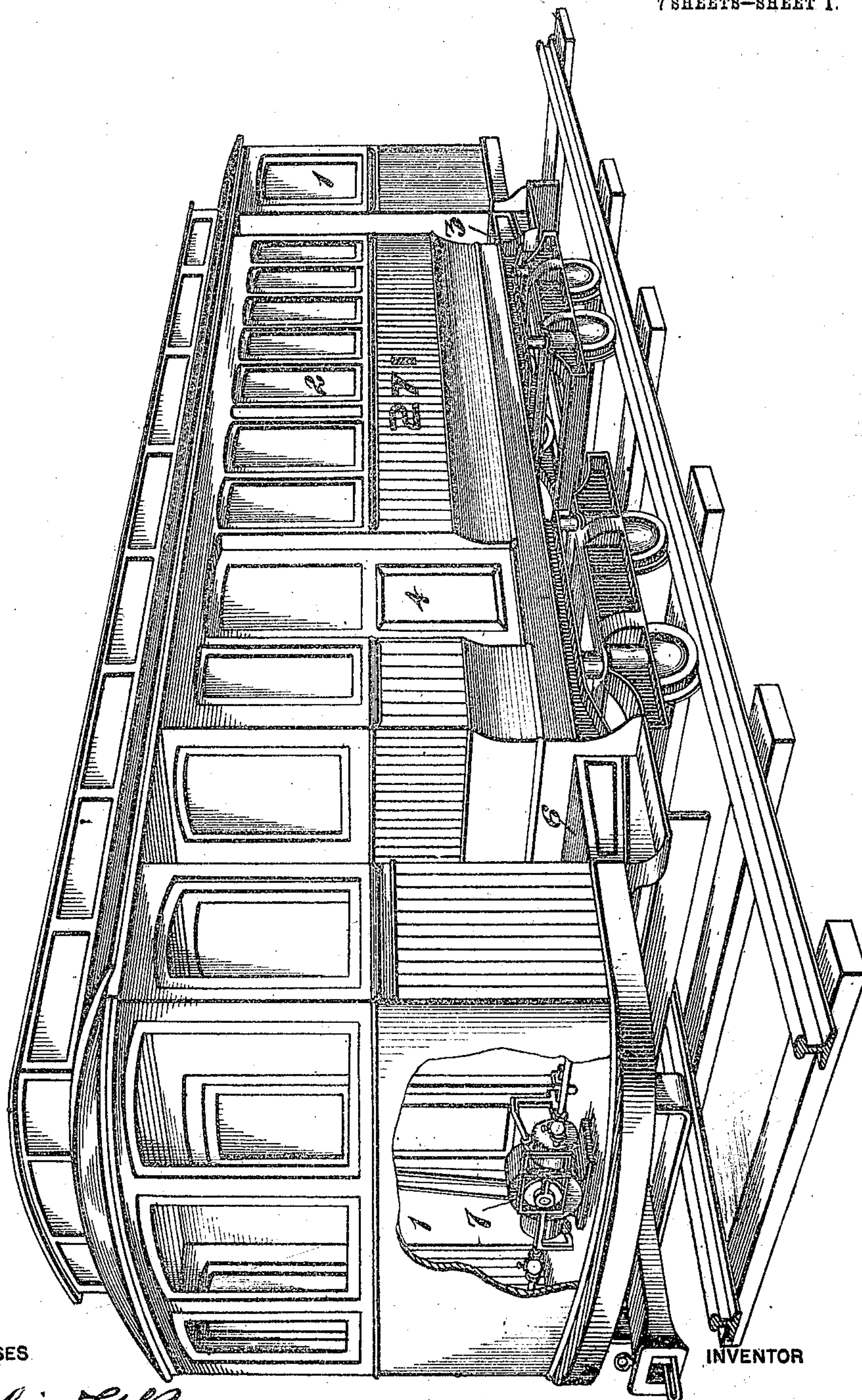
No. 847,515.

PATENTED MAR. 19, 1907.

G. G. SCHROEDER.  
STREET CAR PROPULSION.

APPLICATION FILED MAR. 20, 1905. RENEWED JUNE 28, 1908.

7 SHEETS—SHEET 1.



**WITNESSES**

Berlin G. Brann.  
Robert J. Spradler

INVENTOR

George G. Schroeder  
By Alfred E. Glascock  
Atty.

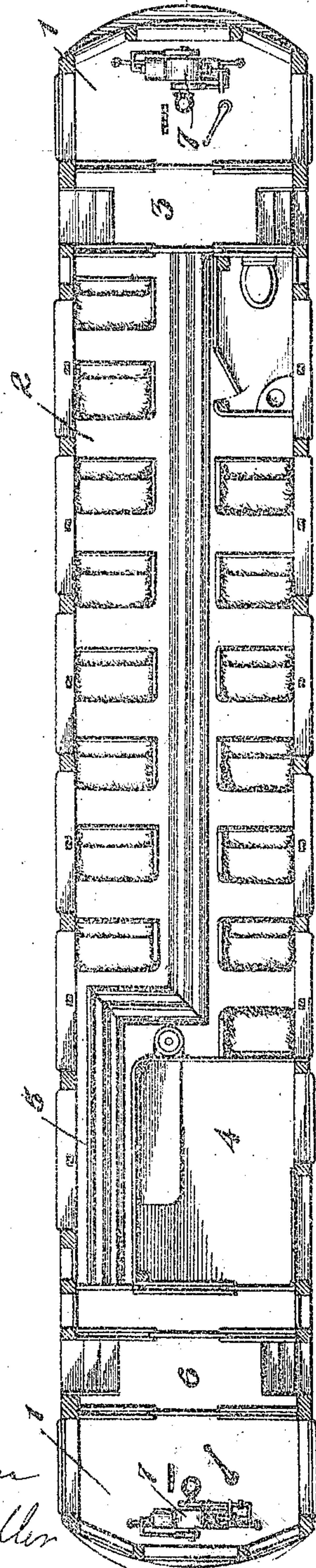
No. 847,515

PATENTED MAR. 19, 1907.

G. G. SCHROEDER.  
STREET CAR PROPULSION.

APPLICATION FILED MAR. 20, 1905. RENEWED JUNE 28, 1906.

7 SHEETS—SHEET 2



*W. G. P.*

Witnesses

*Berlin G. Brown*  
*Robert J. Spindler*

Inventor  
*George G. Schroeder*

By *Alfred E. Glanville*

Attorney



No. 847,515.

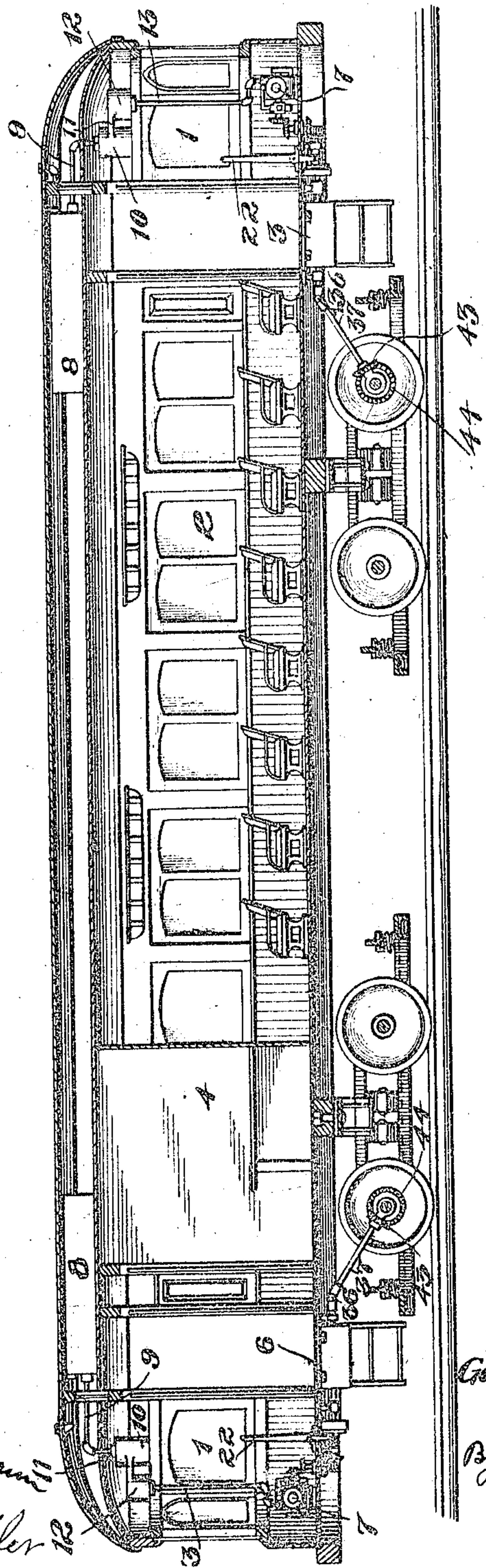
PATENTED MAR. 19, 1907.

G. G. SCHROEDER.  
STREET CAR PROPULSION.

APPLICATION FILED MAR. 20, 1905. RENEWED JUNE 28, 1906.

7 SHEETS—SHEET 3.

Fig. 3.



Witnesses  
Beckham  
Robert J. Schaller

Inventor  
George G. Schroeder  
By Alfred E. Glusack  
Attorney



No. 847,515.

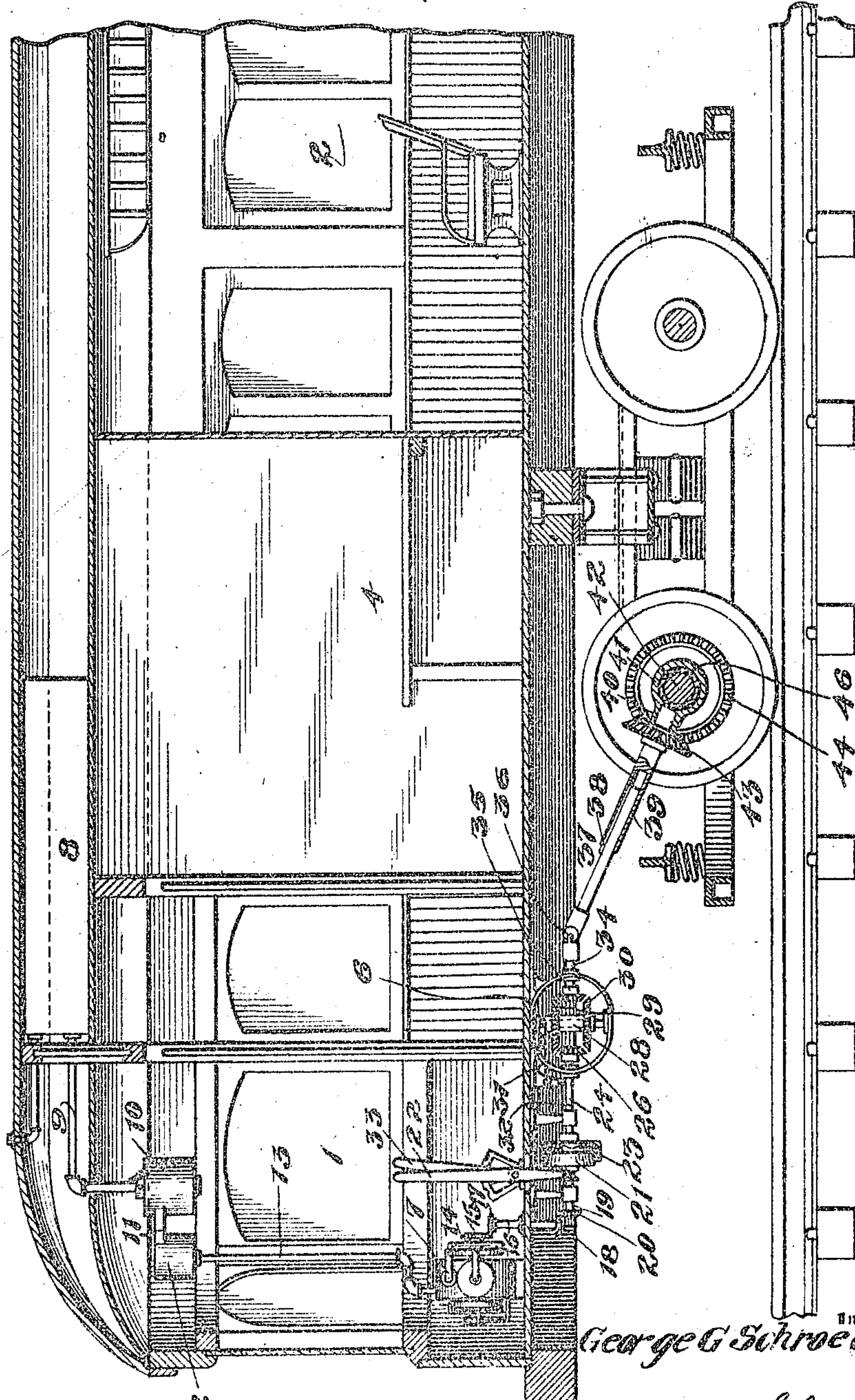
PATENTED MAR. 19, 1907.

G. G. SCHROEDER.  
STREET CAR PROPULSION.

APPLICATION FILED MAR. 20, 1905. RENEWED JUNE 28, 1906.

7 SHEETS—SHEET 4.

Fig. 1.



Witnesses

Benjamin T. Brown  
Robert J. Spindler

36

George G. Schroeder  
Alfred E. Glascock  
Attorney

No. 847,515.

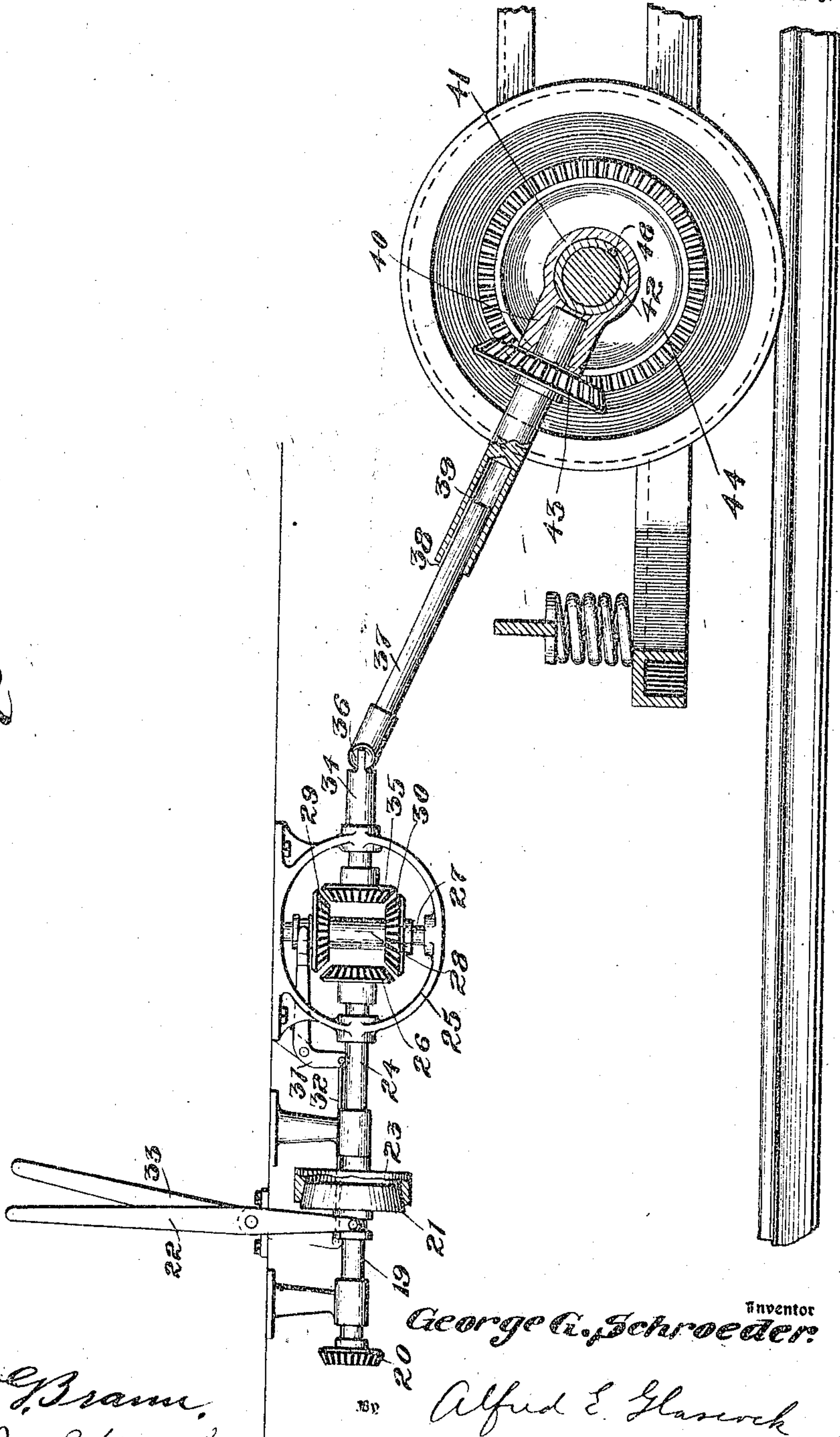
PATENTED MAR. 19, 1907.

G. G. SCHROEDER.

## STREET CAR PROPULSION.

APPLICATION FILED MAR. 20, 1905. RENEWED JUNE 28, 1906.

7 SHEETS—SHEET 5.



*George G. Schroeder* <sup>Inventor</sup>

Alfred E. Glascock

Attorney,

**Witnesses**

Berlin G. Brann.

Robert J. Spindler



No. 847,515.

PATENTED MAR. 19, 1907.

G. G. SCHROEDER.  
STREET CAR PROPULSION.

APPLICATION FILED MAR. 20, 1905. RENEWED JUNE 28, 1906.

7 SHEETS—SHEET 6.

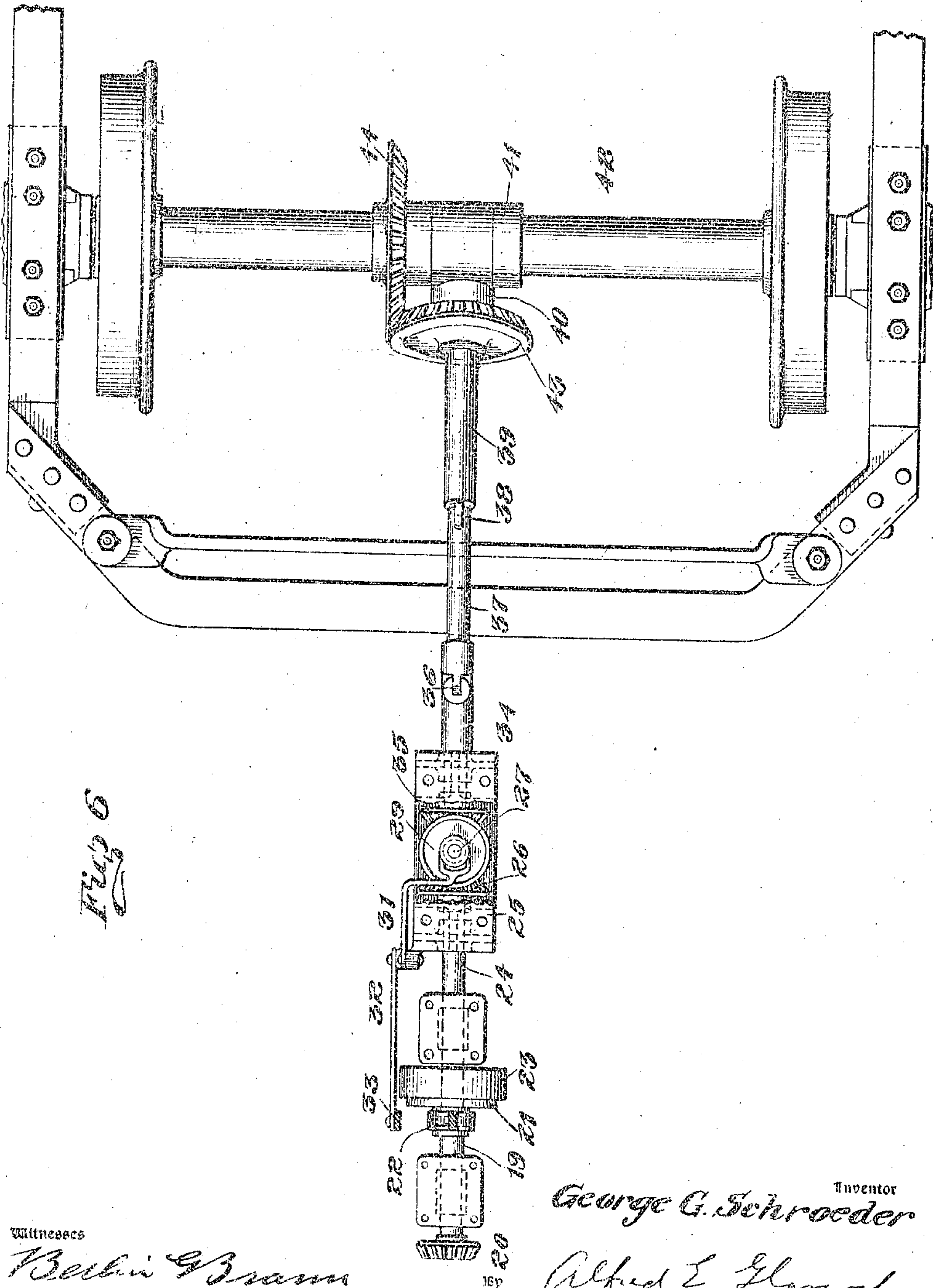


Fig 6

Witnesses

Beck & Bram  
Robert J. Spindler

George G. Schroeder  
Alfred E. Glanville  
Inventor  
Attorney

No. 847,515.

PATENTED MAR. 19, 1907.

G. G. SCHROEDER.

STREET CAR PROPULSION.

APPLICATION FILED MAR. 20, 1905. RENEWED JUNE 28, 1906.

7 SHEETS—SHEET 7.

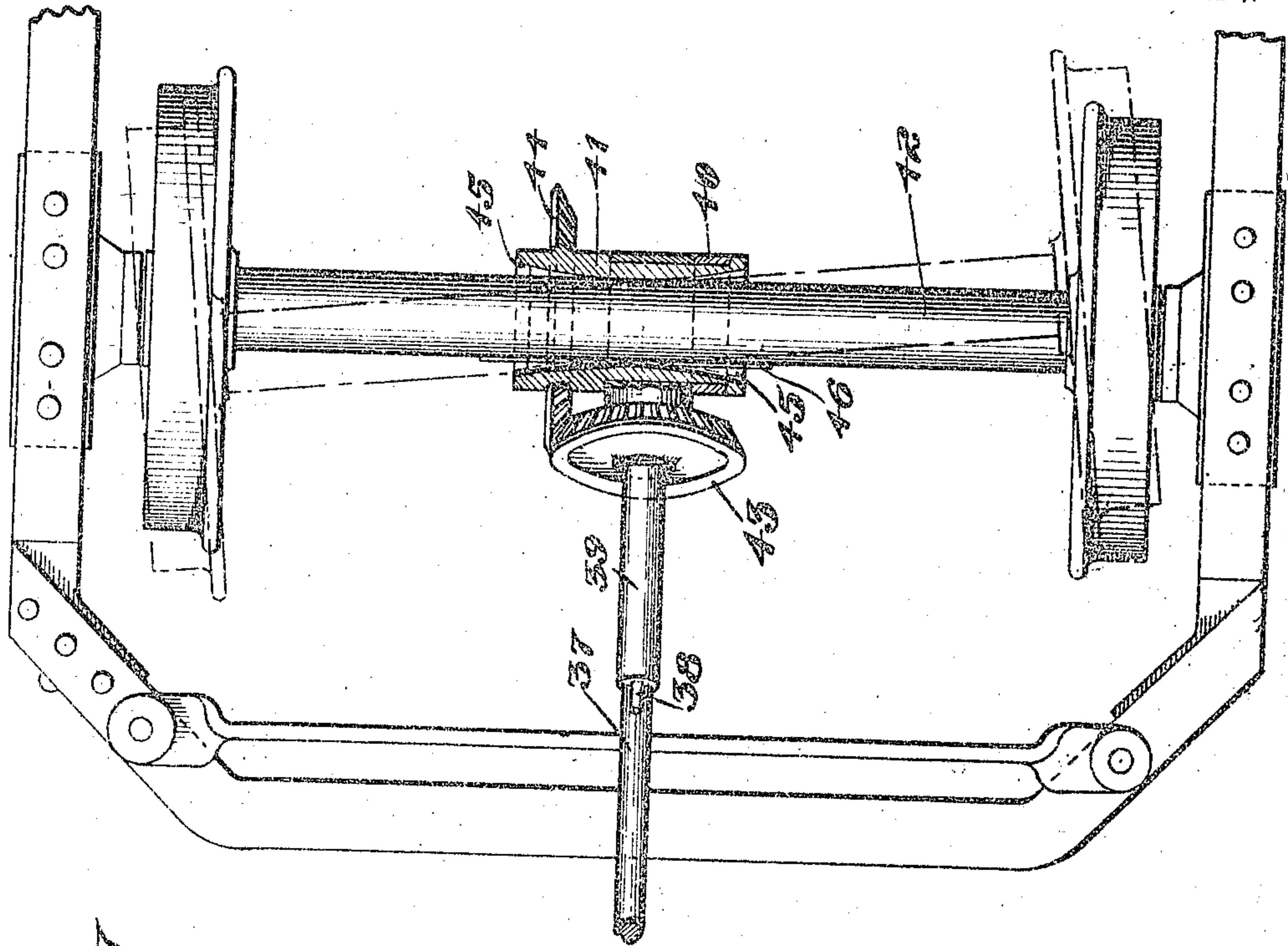


Fig. 7

WITNESSES

Berlin G. Brann,  
Robert J. Spindler

INVENTOR

George G. Schroeder.  
By Alfred E. Glascock  
Atty



# UNITED STATES PATENT OFFICE.

GEORGE G. SCHROEDER, OF WASHINGTON, DISTRICT OF COLUMBIA.

## STREET-CAR PROPULSION.

No. 847,515.

Specification of Letters Patent.

Patented March 19, 1907.

Application filed March 20, 1905. Renewed June 28, 1906. Serial No. 323,863.

*To all whom it may concern:*

Be it known that I, GEORGE G. SCHROEDER, a citizen of the United States, residing at Washington, in the District of Columbia, have invented new and useful Improvements in Street-Car Propulsion, of which the following is a specification.

This invention has relation to street-car propulsion; and it consists in the novel construction and arrangement of its parts, as hereinafter shown and described.

The object of this invention is to provide a means for propelling cars, said means consisting of an engine (preferably of the rotary hydrocarbon type) located at each end of the car, one engine adapted to be used for moving the car in one direction along the track and the other engine being adapted to move the car in the opposite direction. Both of the said engines are alike in construction and are similarly connected to the front and rear car-axles, respectively. The gearing between the engine and the car-axle is of special construction and arrangement and is so arranged as to permit the car trucks and axles to describe a partial rotation with relation to the car-body when going around curves. A means is also provided to permit the car-body to move vertically with relation to the trucks, as when loading or unloading, and also to permit the car-body to oscillate, as when in motion and going over obstructions, switches, or uneven track. Each end of the car is provided with a compartment in which an engine is located. The operator having charge of the engine also occupies the said compartment. Most of the gearing between the engine and the car-axle is located beneath the floor of the car-body, and consequently does not occupy space in the body of the car. A means is provided for throwing the engine-shaft in gear with the gearing at will, and a means is provided for reversing the motion from the engine-shaft (which rotates continuously in one direction) with the car-axle. This latter means is for convenience in use for backing the car or for moving the same for short distances in either direction.

The car-body proper is also of special construction and arrangement, as will be hereinafter more particularly pointed out.

In the accompanying drawings, Figure 1 is

a perspective view of a car with a portion of one end thereof broken away, showing the location of one engine. Fig. 2 is a horizontal sectional view of the car-body, showing the various compartments thereof, with the positions of the engines at each end indicated. Fig. 3 is a vertical sectional view of the car-body, showing the engines located at each end thereof. Fig. 4 is an enlarged sectional view of one end of the car, showing the location of the engine and the transmission-gear. Fig. 5 is a side elevation, partly in section, of the gearing for transmitting motion from the engine-shaft to the car-axle. Fig. 6 is a top plan view of the gearing for transmitting motion from the engine to the car-axle; and Fig. 7 is a top plan view, partly in section, of a portion of the gearing and car-axle showing the means for permitting the said axle to describe a partial rotation in a horizontal plane.

The car-body is provided at each end with an engine-compartment 1. The passenger-compartment 2 occupies the major portion of the body of the car, and extends from one of the engine-compartment 1, toward the other engine-compartment. The said passenger-compartment 2 is separated from the adjacent engine-compartment 1 by the platform 3. The freight-compartment 4 is located at the end of the passenger-compartment 2, and the aisle 5 passes between the back of the freight-compartment 4 and the side of the car-body and leads from the platform 6 into the passenger-compartment 2. The platforms 3 and 6 are provided with suitable steps at each side, as indicated, and the passenger-compartment 2 is provided with seats and other accessories usually found in conveyances of this character.

In each of the compartments 1 is located an engine 7. The said engines are of the rotary hydrocarbon type, and any suitable construction of engine (preferably of such type) may be employed. As the engine proper forms no part of this invention, a description of its construction and operation is deemed unnecessary. Each engine 7 is provided with an oil-tank 8, suitably located, (preferably in the roof of the car.) The pipe 9 connects the tank 8 with the carbureter 10. The pipe 11 connects the carbureter 10 with the mixer 12, and the pipe 13 connects the



said mixer with the engine 7. The tank 8, carbureter 10, and mixer 12 may be of any suitable construction.

The shaft 14 of the engine 7 is provided at its end with the beveled gear-wheel 15. The shaft 16 extends vertically through the floor of the car-body and is provided at its upper end with the beveled gear-wheel 17, which meshes with the beveled gear-wheel 15. The said shaft 16 is provided at its lower end with the beveled gear-wheel 18. Suspended from the body of the car is a short horizontal shaft 19, which is provided at one end with a beveled gear-wheel 20, which meshes with the gear-wheel 18. The other end of said shaft 19 is provided with the sliding disk 21 of the friction-clutch. The lever 22 passes through the floor of the car-body and engages at its lower end the sliding disk 21 and is adapted to be operated from within the compartment 1. The disk 23 is located upon the end of the shaft 24. Said shaft 24 extends in alinement with the shaft 19. The said disk 23 is fixed upon the shaft 24 and is adapted to be engaged and disengaged by the sliding disk 21. The bracket 25 is attached to the under side of the car-body, and one end of the shaft 24 is journaled in said bracket. The end of the shaft 24 within the said bracket 25 is provided with a beveled gear-wheel 26. The pin 27 is vertically located within the bracket 25, and upon said pin is located a sliding sleeve 28. The said sleeve 28 is provided with the beveled gear-wheels 29 and 30. The bell-crank lever 31 is attached at one end to the sleeve 28 and is fulcrumed to the under side of the car-body. The rod 32 is attached to the other end of the said bell-crank lever 31 and at its opposite end is attached to the lower end of the lever 33. The said lever 33 extends vertically through the bottom of the car-body, its upper end being in the compartment 1.

The shaft 34 is in alinement with the shaft 24. The inner end of the shaft 34 is provided with the beveled gear-wheel 35, and the outer end of the said shaft 34 is provided with the universal joint 36. The upper end of the shaft 37 is attached to one of the members of the universal joint 36, and the lower end of the said shaft 37 is provided with a feather 38. The feathered end of the shaft 37 enters the sleeve 39 and is adapted to play longitudinally therein. The lower end of the sleeve 39 is made solid and cylindrical and is journaled in the bearing 40. Said bearing 40 in turn is journaled upon the collar 41, which surrounds the axle 42. At an intermediate point the sleeve 39 is provided with a beveled gear-wheel 43, which meshes with a beveled gear-wheel 44, attached to one end of the collar 41. The ends of the opening through the collar 41 are flared or enlarged in diameter, as at 45, so that the axle 42 may have a slight lateral swing within the said collar. The

axle 42 is provided with a feather 46, which causes the said axle to rotate with the collar 41. In place of the said feather 46 pins or other suitable means may be substituted, if desired.

From the above description of the construction of the gearing it will be observed that when the disk 21 is thrown into engagement with the disk 23 that the shaft 24 and its attachments will rotate with the shaft 19, which in turn gets its rotary motion from the engine-shaft 14 through the shaft 16. When the gear-wheel 29 is moved into engagement with the gear-wheels 26 and 25, the shaft 34 rotates in the opposite direction from the rotation of the shaft 24. When the gear-wheel 30 is moved into engagement with the gear-wheels 26 and 35, the shaft 34 rotates in the same direction as does the shaft 24.

As above described, the gear-wheels 29 and 30 are operated through the lever 33. Both of the said gear-wheels cannot be in engagement with the gear-wheels 26 and 35 at the same time; but, as indicated in Fig. 5, the said gear-wheels 29 and 30 are so spaced apart upon the sleeve 28 as to be both out of engagement with the gear-wheels 26 and 35. Thus the reversing of the motion from the engine-shaft 14 is accomplished. The engine-shaft rotates in one direction only.

As the body of the car elevates or depresses with relation to the trucks the feathered end of the shaft 37 moves in or out of the end of the sleeve 39, and thus the difference in the relative distance between the body of the car and the trucks is compensated for.

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

1. An improvement in car propulsion comprising a sleeve adapted to surround the axle of a car to rotate the same, said sleeve being free to move longitudinally on said axle, the bore of said sleeve being constructed to permit the axle to swing horizontally, and means for rotating said sleeve.

2. An improvement in car propulsion comprising a sleeve adapted to surround the axle of a car to rotate the same, said sleeve being free to move longitudinally on said axle, the bore of said sleeve being constructed to permit the axle to swing horizontally, means for rotating said sleeve, and means for reversing the direction of rotation of said sleeve.

3. An improvement in car propulsion comprising a sleeve adapted to surround the axle of a car to rotate the same, said sleeve being free to move longitudinally on said axle, the bore of said sleeve being constructed to permit the axle to swing horizontally, driving means for rotating said sleeve, and means for permitting the driving means to be elevated or depressed with relation to said sleeve.

4. An improvement in street-car propulsion comprising a sleeve adapted to surround



an axle of the car and impart movement thereto, said sleeve being constructed to permit said axle to swing horizontally, driving means for rotating said sleeve, and means connected to said sleeve for permitting the driving means to be elevated or depressed with relation to said sleeve.

5. An improvement in car propulsion comprising a sleeve adapted to surround an axle of the car and constructed to impart movement thereto, the bore of said sleeve being flared or enlarged at each end, and means for rotating said sleeve.

6. An improvement in car propulsion comprising a power-shaft, means for rotating the same, a sleeve adapted to surround an axle of the car to rotate the same, said sleeve being free to move longitudinally on said axle, its bore being constructed to permit said axle to describe a partial rotation on a horizontal plane, a telescoping shaft connected at one end to said power-shaft and supported at its other end by said sleeve, and means operated by said telescoping shaft to rotate said sleeve.

7. An improvement in car propulsion comprising a sleeve adapted to surround an axle of the car to rotate the same, said sleeve being free to move longitudinally on said axle, its bore being constructed to permit said axle to describe a partial rotation on a horizontal plane, a bearing supported by said sleeve, a shaft having one end mounted in said bearing, gearing connecting said shaft and sleeve, and means for rotating said shaft.

8. An improvement in car propulsion comprising a sleeve adapted to surround an axle of the car to rotate the same, the bore of said sleeve being flared or enlarged at each end, a bearing supported by said sleeve, a telescoping shaft having one end supported by said bearing, gearing between said shaft and sleeve, and means for rotating said shaft.

9. A car-body having at each end an engine-compartment, a freight-compartment located near one end of the body, and separated from the adjacent engine-compartment by a platform, and a passenger-compartment located between said freight-compartment and the other engine-compartment, and being separated from the last said engine-compartment by a platform.

10. A car-body having at each end an engine-compartment, a passenger-compartment located adjacent one of said engine-compartments, and being separated from the same by a platform, a freight-compartment located adjacent the other engine-compartment, and being separated from the same by a platform, and an aisle leading by the said freight-compartment from the platform adjacent thereto into the passenger-compartment of the car.

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

GEORGE G. SCHROEDER.

Witnesses:

E. W. VAN DYKE,  
BARTON E. BROOKE.