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O. BLESSING.

MOTOR CAR.

No. 486,660. Patented Nov. 22, 1892.

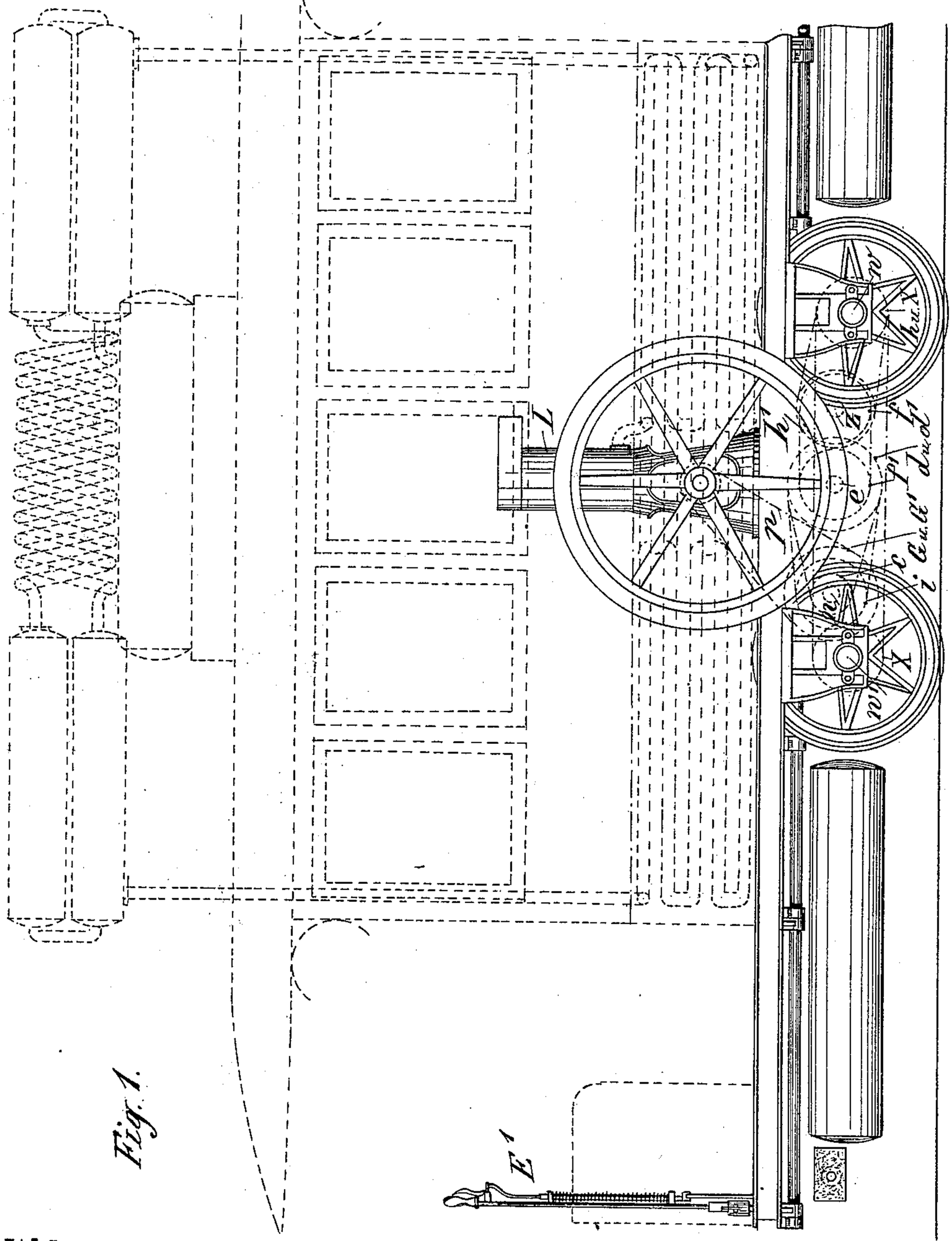

Fig. 1.

Witnesses:
A. Faber du Faur
Joseph Elsin

Inventor:
Oskar Blessing,
by A. Faber du Faur Jr
Atty

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O. BLESSING.

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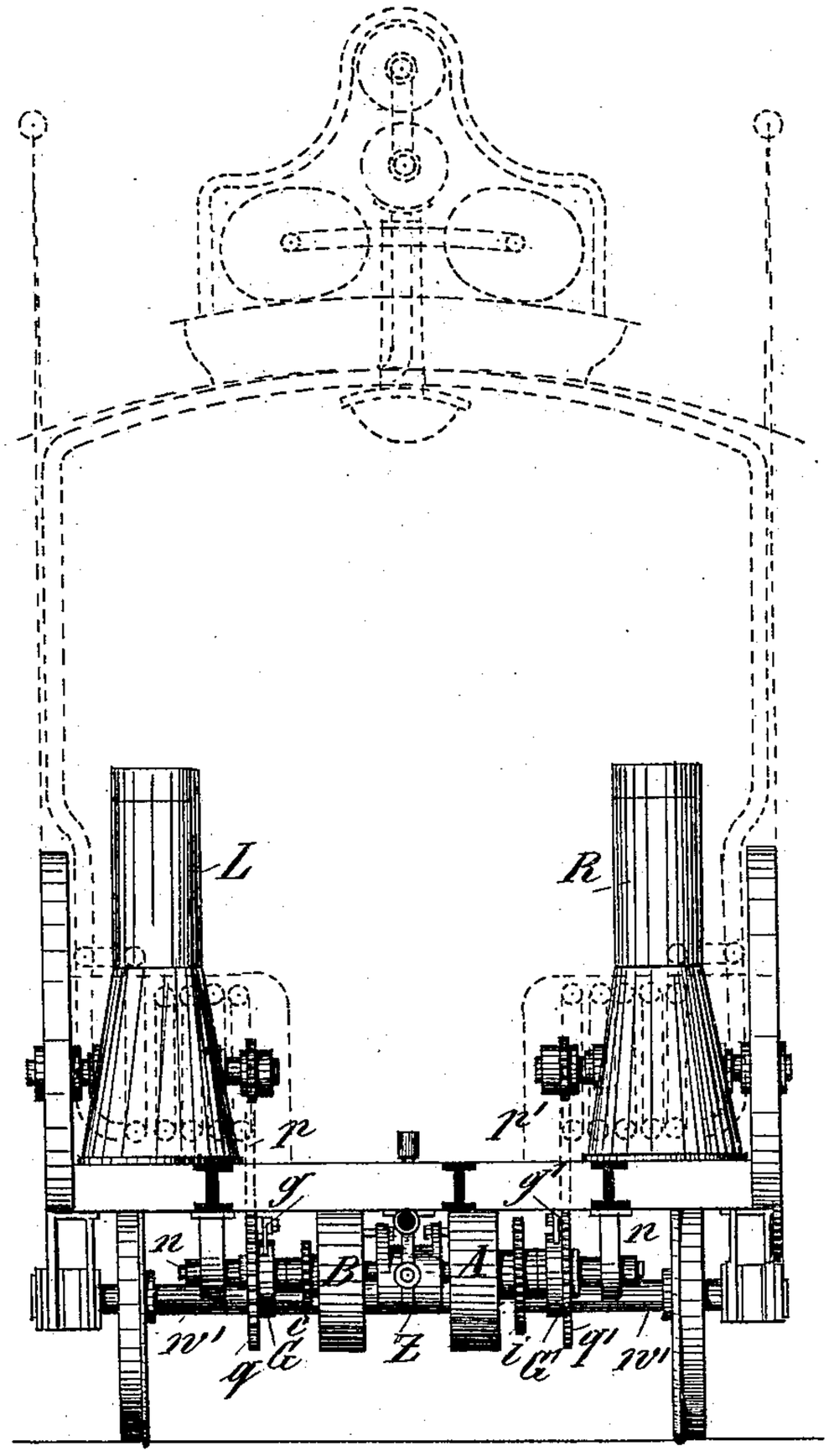
Fig. 2.



Witnesses:
A. Faber du Faur
Joseph Elias

Inventor:
Oskar Blessing;
by A. Faber du Faur Jr.
Atty.

(No Model.) 6 Sheets—Sheet 3.

O. BLESSING.

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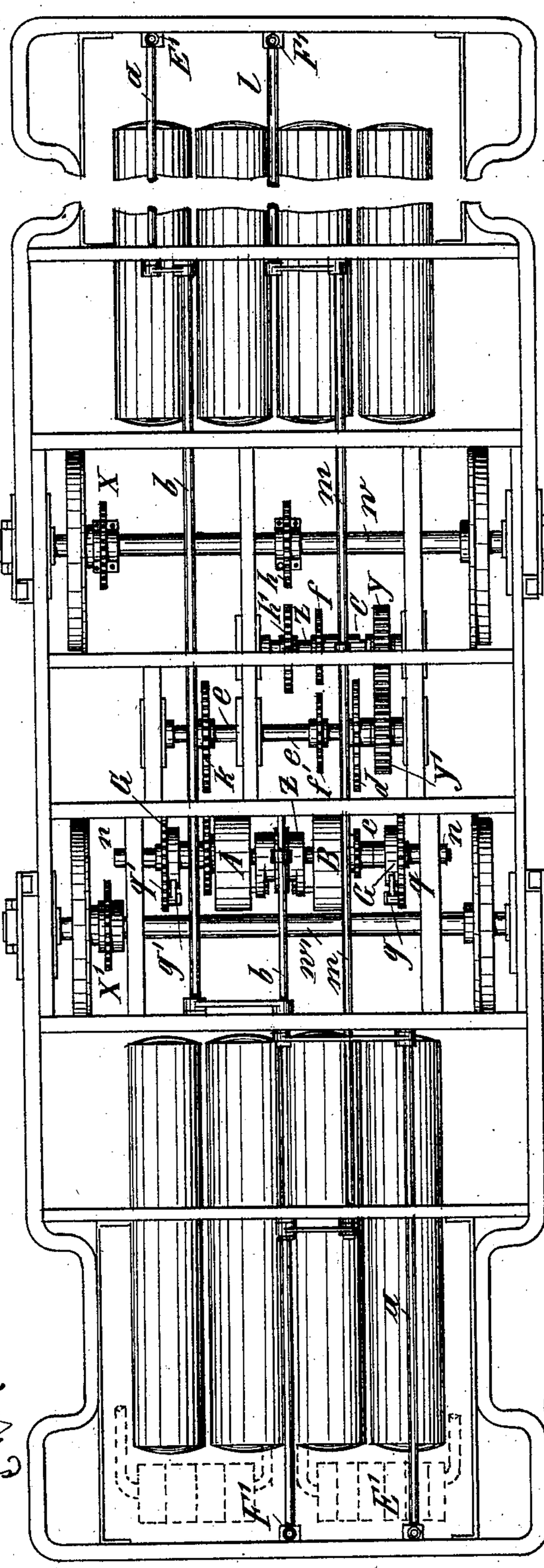


Witnesses:
A. Faber du Faur
Joseph Elias

Inventor:
Oskar Blessing,
by A. Faber du Faur
Atty.

(No Model.) 6 Sheets—Sheet 4.

O. BLESSING.

MOTOR CAR.

No. 486,660. Patented Nov. 22, 1892.

Fig. 4.

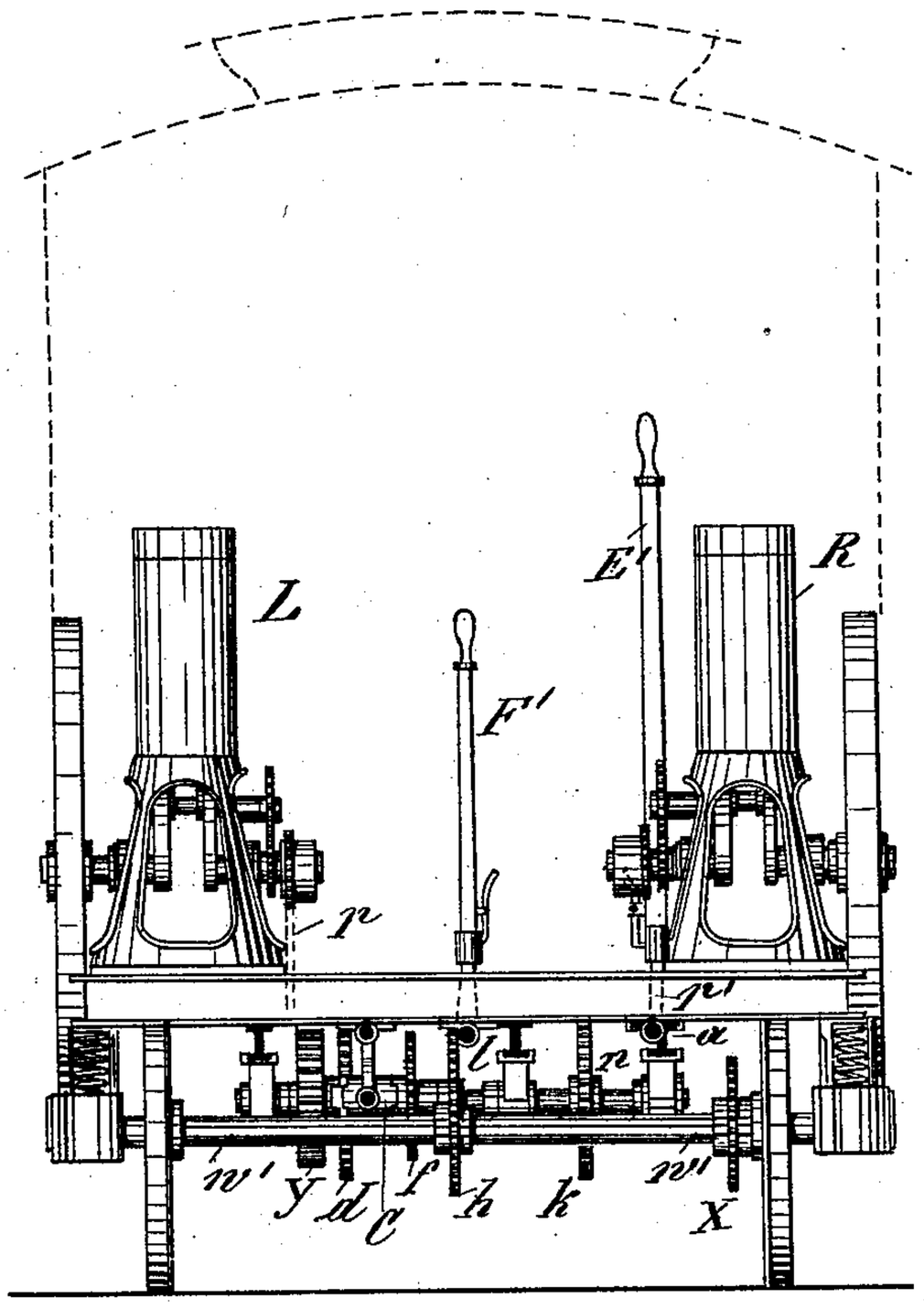
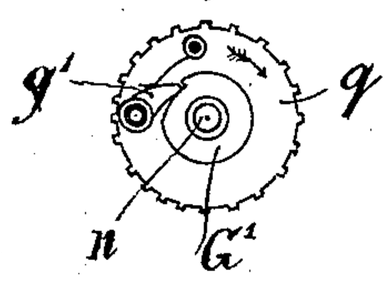


Fig. 5



Witnesses:
A. Faber du Faur
Joseph Elias

Inventor:
Oskar Blessing.
by A. Faber du Faur Jr.
Atty.

(No Model.) 6 Sheets—Sheet 5.

O. BLESSING.

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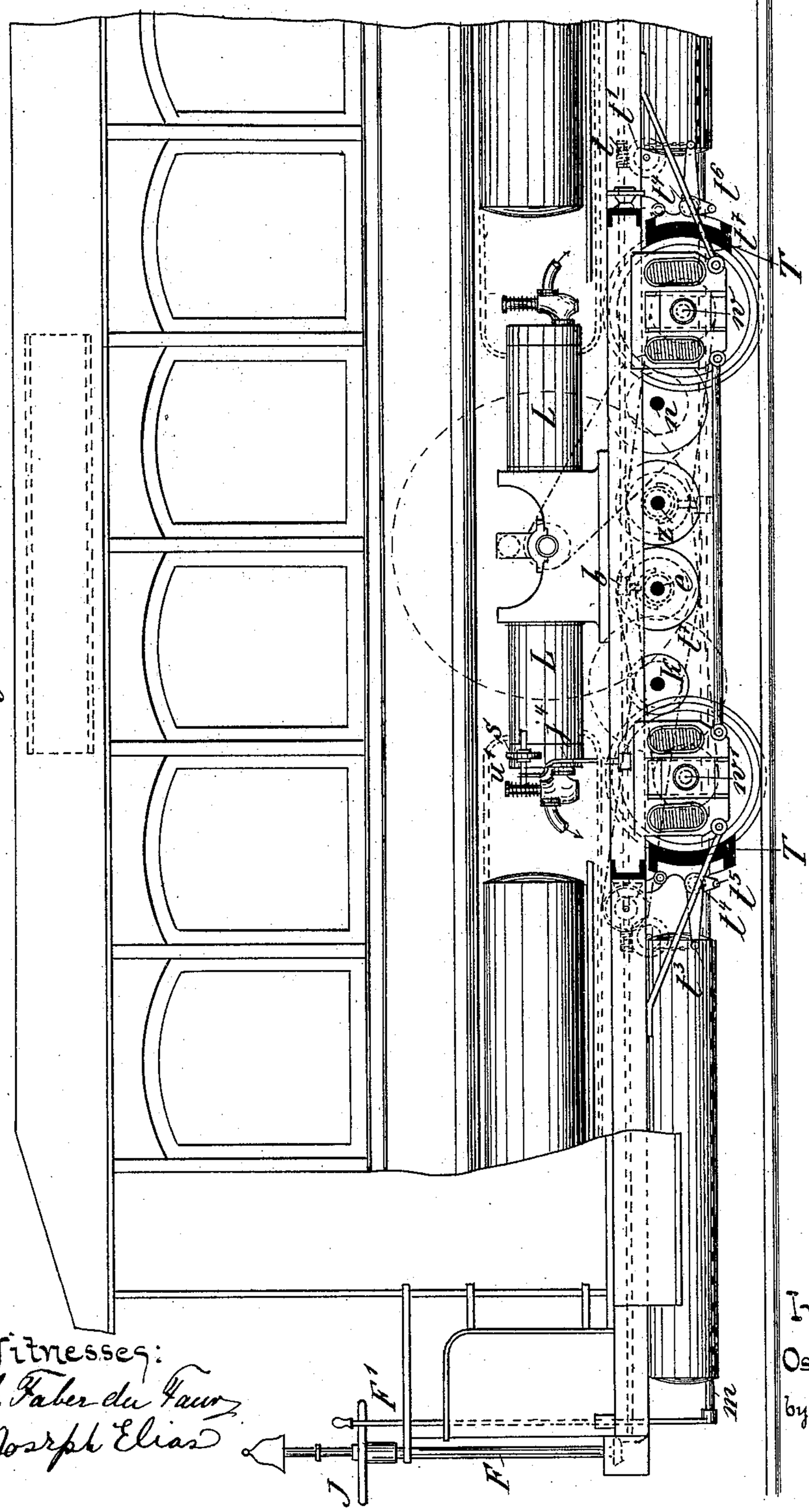


Witnesses:
A. Faber du Faur
Joseph Elias

Inventor:
Oskar Blessing
by A. Faber du Faur.
Atty.

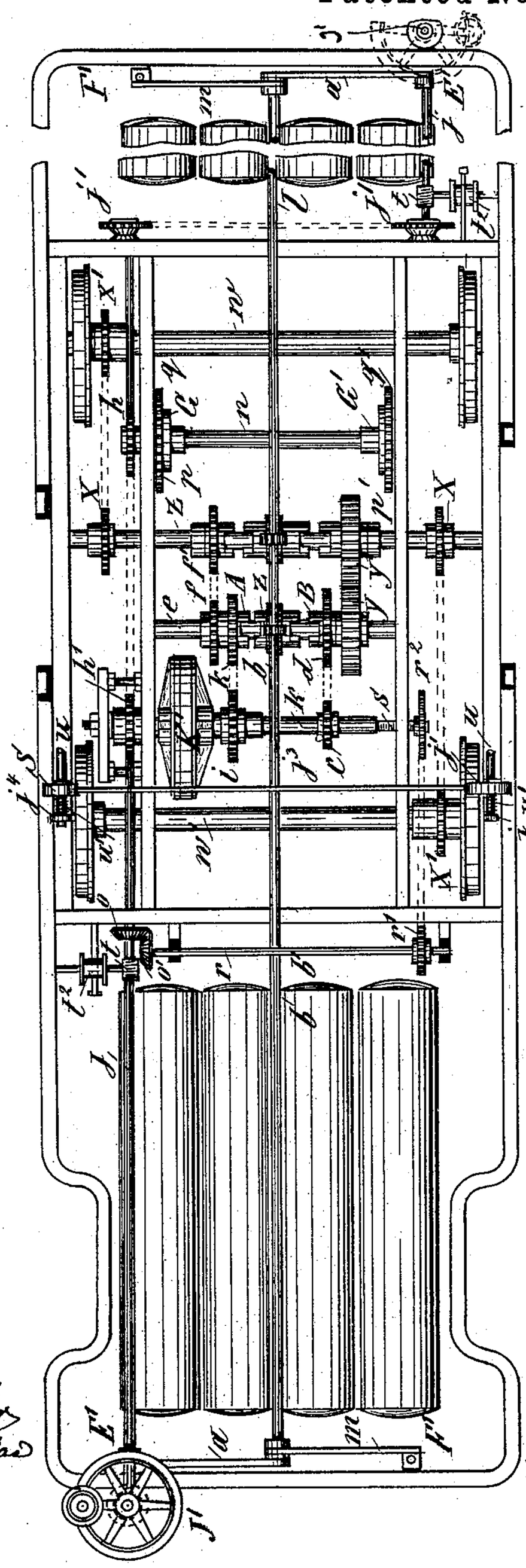
(No Model.) 6 Sheets—Sheet 6.

O. BLESSING.

MOTOR CAR.

No. 486,660. Patented Nov. 22, 1892.

Fig. 1.



Witnesses:
A. Faber du Faur
Joseph Elias

Inventor:
Oskar Blessing
by A. Faber du Faur.
Atty.

UNITED STATES PATENT OFFICE.

OSKAR BLESSING, OF DRESDEN, GERMANY.

MOTOR-CAR.

SPECIFICATION forming part of Letters Patent No. 486,660, dated November 22, 1892.

Application filed January 11, 1892. Serial No. 417,774. (No model.)

To all whom it may concern:

Be it known that I, OSKAR BLESSING, a subject of the King of Saxony, residing at Dresden, in the Kingdom of Saxony, German Empire, have invented new and useful Improvements in Tram-Cars, of which the following is a specification.

My invention has reference to improvements in tram-cars and similar vehicles propelled by self-contained motors; and it consists in certain novel features in the construction and arrangement of the several operative parts, as fully pointed out in the following specification and claims and illustrated in the accompanying drawings, in which—

Figure 1 represents a side elevation, with part broken away, of a tram-car embodying my invention. Fig. 2 is a sectional elevation looking from the left-hand side of Fig. 1. Fig. 3 is a similar view looking from the opposite side. Fig. 4 is a plan or top view. Fig. 5 is a detail view. Fig. 6 is a side elevation showing the application of the brake mechanism. Fig. 7 is a plan view of the same.

Similar letters indicate corresponding parts throughout the several views.

In the drawings, the letter *n* designates a shaft driven from the motor. In this example I have shown two gas-motors L and R. However, it is evident that any other suitable motors could be used.

e is an intermediate shaft placed parallel with the shaft *n* and connected with the latter by two sets of transmission-wheels, or, as here shown, by two sets of sprocket-wheels and chains. The wheels *i k* of one set are proportioned to transmit to the shaft *e* approximately the same speed that shaft *n* is driven at, while the wheels *c d* of the second set are proportioned to reduce the speed of shaft *e* to about one-half of that of shaft *n*. The wheels *c* and *i* are loosely mounted with respect to shaft *n* and are respectively secured to the parts A B of a double clutch-coupling. The clutch Z is feathered to the shaft *n*, and can be caused to engage with either part of the coupling by shifting a lever E′, connected with said clutch by a suitable transmitting-gear *a b*, and thereby ultimately cause the car to run either fast or slow.

In starting the car the lever E′ is first turned to the left, whereby the clutch Z is thrown into engagement with part B of the coupling, and the shaft *e* rotates at only one-half the speed of shaft *n*. The lever is then turned to the right and clutch Z engages with part A, and the shaft *e* is driven at the same speed as shaft *n*.

It is evident that by setting the lever E′ to bring the clutch Z in its neutral position the motors will run without propelling the car.

z is the second intermediate shaft connected to the shaft *e* by two sets of transmission-wheels. The one set consists of two gear-wheels *y y′* and the second set of two sprocket-wheels *f f′*, connected by a suitable chain. The wheels *f* and *y* are loosely mounted on the shaft *z* and are adapted to be respectively engaged by a coupling-clutch C, feathered to the shaft *z*. The clutch is shifted to engage with either of said wheels by a lever F′, connected with the said clutch by a suitable transmitting-gear *l m*, Figs. 3 and 4.

When the clutch C is in engagement with the gear-wheel *y*, the shaft *z* is rotated in a direction contrary to that in which shaft *e* rotates, while when the clutch is in engagement with the wheel *f* the shaft *z* is rotated in the same direction as shaft *e*.

Of course in place of the chain and the sprocket-wheels *f f′* gear-wheels could be substituted for the purpose of turning the shaft *z* in the same direction as shaft *e*.

The motion of the shaft *z* is transmitted to one of the wheel-axles *w* by a suitable train of gears, or by sprocket-wheels *h h′* and a chain, Fig. 3. From this axle the motion may also be transmitted to the second axle *w′* by sprocket-wheels X X, connected by a suitable chain. The wheels, if necessary, could be coupled by rods and cranks in a well-known manner.

It is evident that shaft *z* could be omitted and the gear-wheels, &c., thereon be placed directly on the axle *w*.

When two motors, as here shown, or more, are employed, all acting on the same driving-shaft, it is advisable in case but one motor is employed to throw the idle motor or motors out of gear, and this is especially true when gas or petroleum motors are used, which latter rapidly wear out when running idle. To accomplish this, the main shafts of the motors L and R are independently connected to the

shaft n by sprocket-wheels $q\,q'$ and chains $p\,p'$. The wheels $q\,q'$, Fig. 5, are mounted loosely on the shaft n and are connected therewith by disks G G', secured to the shafts, and by spring-pressed pawls $g\,g'$, pivoted to the faces of the gear-wheels and engaging with notches in said disks. If one of the motors is thrown out of action, the disk corresponding to the second motor turns without affecting the corresponding gear-wheel, and consequently the parts of the motor remain stationary.

The small motors required for the propulsion of the car can readily be so arranged as not to inconvenience the passengers.

In starting the car the vehicle is first put to the lower speed, as before described, and then its motion accelerated to the normal speed, while in stopping it is first slowed down. In practice levers are arranged at both ends of the car for permitting the driving-gear to be controlled from either end, this being preferably effected by the movement of a single lever operated by one hand of the engineer, while with the other he can operate an ordinary brake-lever, if required.

In Figs. 6 and 7 I have shown the brake mechanism so constructed and arranged that on applying the brakes the shafts of the motors are thrown out of gear, and at the same time the speed of the motor or motors is controlled by shutting down the governor or governors.

K represents an additional shaft arranged parallel to the shafts n, e, and z, before described. This shaft is made in two parts adapted to be united by a suitable friction-coupling K', one part of the shaft being capable of longitudinal motion and terminating in a screw-spindle s engaging a nut in the frame of the car. The other part of the shaft is driven from the main shaft n by sprocket-wheels $h\ h'$ and a chain in the same direction and at the same speed as said shaft n. From the coupling-shaft K motion is transmitted to the shafts $e\,z$ and from thence to the axles of the car in the manner before described to impart to the same either a high or low speed and to reverse the direction of motion of the same. The rotation of the screw-spindle s is effected by the brake mechanism in such a manner that on applying the brakes connection between the two parts of shaft K is broken at the friction-coupling K', and on taking off the brakes the union is again effected.

J designates the hand-wheel of the brake mechanism affixed to a vertical spindle J'. j is a horizontal longitudinal shaft receiving motion from spindle J' and connected by bevel-gears $o\,o'$ to a transverse shaft r. At the opposite end of shaft r is affixed a sprocket-wheel r', connected by a suitable chain with a wheel r^2, secured to the screw-spindle s of the coupling-shaft K, whereby the motion of the hand-wheel J is transmitted to said shaft. The shaft j is formed, also, with a worm t, engaging a worm-wheel t', upon the shaft of which is mounted a drum t^2. The chain t^3, Fig. 6, of the drum is connected to the longer arm of a bell-crank lever t^5, mounted on a rock-shaft t^4. On the opposite end of the shaft is a similar bell-crank lever t^6, suitable bearings being formed in the loosely-suspended brake-shoe. The shorter arm of the bell-crank lever is connected by a rod or chain t^7 to the opposite brake-shoe of the second pair of wheels of the truck. The same brake mechanism is applied to each end of the car. If now the drums t^2 be turned to cause their chains to be wound up, the bell-crank levers are turned and the brake-shoes drawn against the wheels. It being necessary to have the brake-wheel J located to the right hand of the driver, both at the front and back, the shaft j is divided and the parts connected by suitable sprocket-wheels j', Fig. 7.

To transmit the motion of the shaft j to the governors of the motors, a screw-thread is formed on the shaft j, to which is fitted a threaded sleeve j^2, having an upwardly-projecting arm carrying a transverse bar j^3. Two forked arms j^4, projecting upwardly from each end of this bar embrace the valve-stems u of the motors. Between these forks and the governor-disks S are placed coiled springs u'. When the brakes are applied, the forks force the springs against the governor-disks, and thereby cause the speed of the motors to be modified.

Suitable mufflers for deadening the noise of the exhaust-gases may be provided. The water for cooling the cylinders of the motors when gas-engines are used is supplied from suitable receivers located at the top of the car (shown in dotted lines in Fig. 1) and is kept in constant circulation. The receivers are connected by coiled pipes surrounded by a perforated casing. The air-supply for the motors is drawn through this casing and takes up heat from the pipes and cools the water circulating through the same.

If desired, the hot air or gases from the motors, as well as the cooling water after service, can be utilized for warming the car by causing the same to pass through suitable coils or radiators preferably arranged under the seats.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a tram-car, the combination of two or more motors, a continuous shaft, and intermediate gears and ratchet mechanism for each motor, connecting the respective motors to said shaft independently of each other to permit the running of one of the motors without affecting the remainder, substantially as described.

2. In a tram-car, the combination of two or more motors, a shaft, wheels mounted loosely upon said shaft and driven, respectively, by said motors, a notched disk for each wheel, secured to the shaft, and pawls carried by said wheels and engaging with the disks for propelling the disks in one direction only, substantially as described.

3. In a tram-car, the combination of the shaft *n*, mechanism intermediate of said shaft and the car-axle for transmitting two different speeds to the axle in either direction and for disconnecting said axle from the shaft *n*, substantially as and for the purpose specified.

4. In a tram-car, the combination of the main shaft *n*, a shaft *e* intermediate of the shaft *n* and the car-axle, a transmission between the two shafts for imparting different speeds to the same, and a transmission between the shaft *e* and the car-axle for imparting a rotary motion in either direction to the same, substantially as described.

5. In a tram-car, the combination of the main shaft *n*, shafts *e* and *z*, intermediate of the shaft *n* and the car-axle, two sets of transmission-wheels between the shaft *n* and shaft *e* for imparting different speeds to the same, a clutch operated by a lever for changing the speeds, two sets of transmission-wheels between shaft *e* and shaft *z* for imparting to the latter shaft a rotary motion in either direction, a clutch operated by a lever for changing the direction of rotation, and a connection between the car-axle and shaft *z*, substantially as described.

6. In a tram-car, the combination of a motor, a coupling-shaft K K′, a transmission intermediate of the motor and said shaft, a connection between said shaft and the car-axle, a brake mechanism, means for coupling and uncoupling the shaft K, actuated from the brake mechanism, and a connection between the brake mechanism and the motor, whereby on applying the brakes the axle is disconnected and the action of the motor modified, substantially as described.

7. In a tram-car, the combination of a motor, a coupling-shaft K K′, provided with a screw-spindle *s*, a connection between said shaft and the car-axle, a brake mechanism actuated by a suitable hand-wheel, a connection between the brake-rod and the screw-spindle of the shaft for imparting a longitudinal motion to the same to couple and uncouple the shaft, the chain-drum t^2, connected with the brake-blocks, and a connection between the brake mechanism and the governor of the motor, substantially as described.

In testimony thereof I have hereunto set my hand in presence of two witnesses.

OSKAR BLESSING.

Witnesses:

RUD. SCHMIDT,

HERNANDO DE SOTO.