2 Sheets—Sheet 1.

W. H. LYNN & C. C. SNYDER.

Car-Starter.

No. 206,590. **Patented July 30, 1878.**

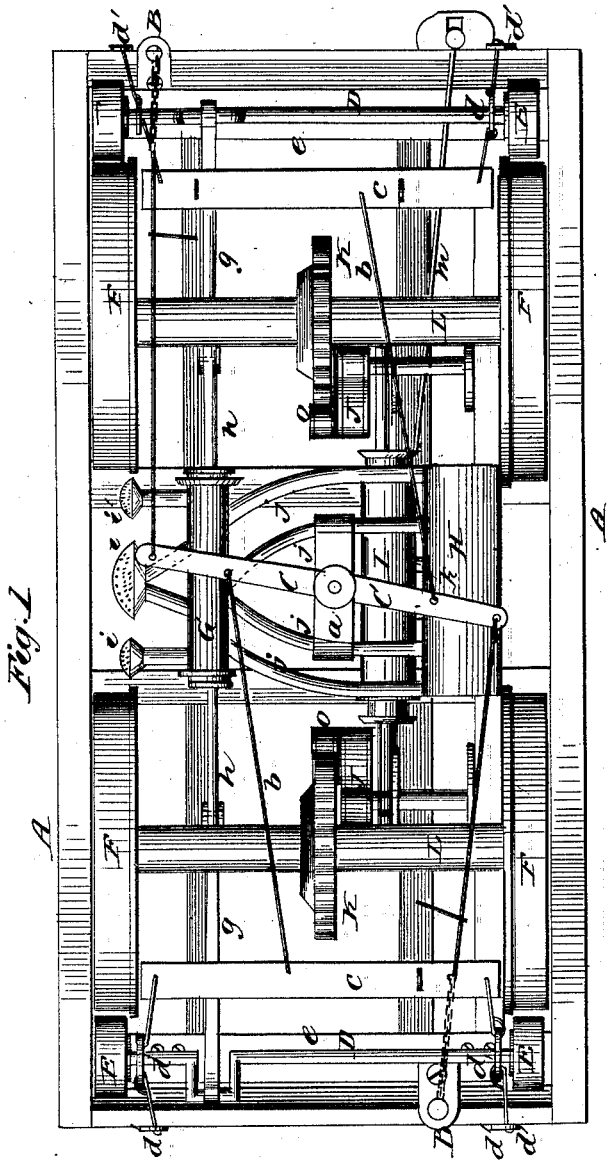

Fig. 1.

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2 Sheets—Sheet 2.

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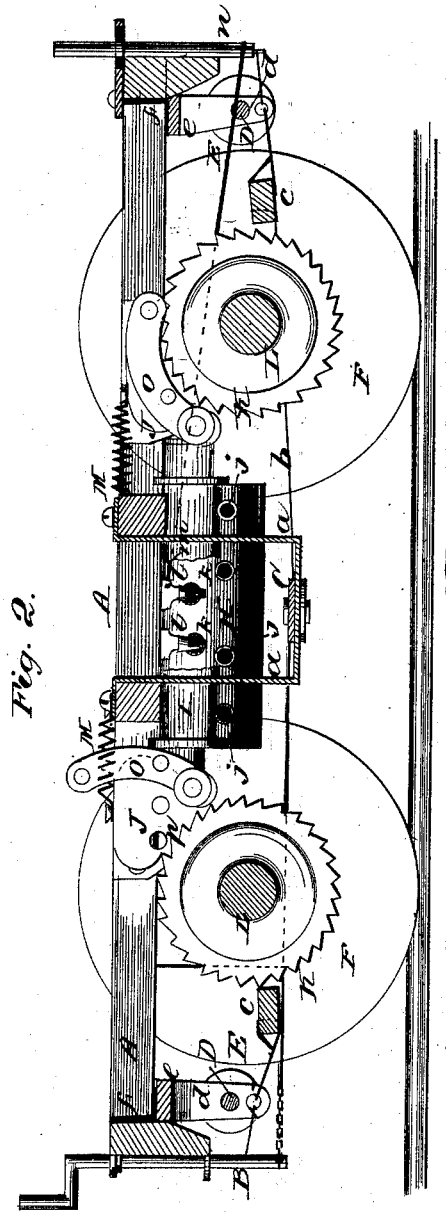

Fig. 2.

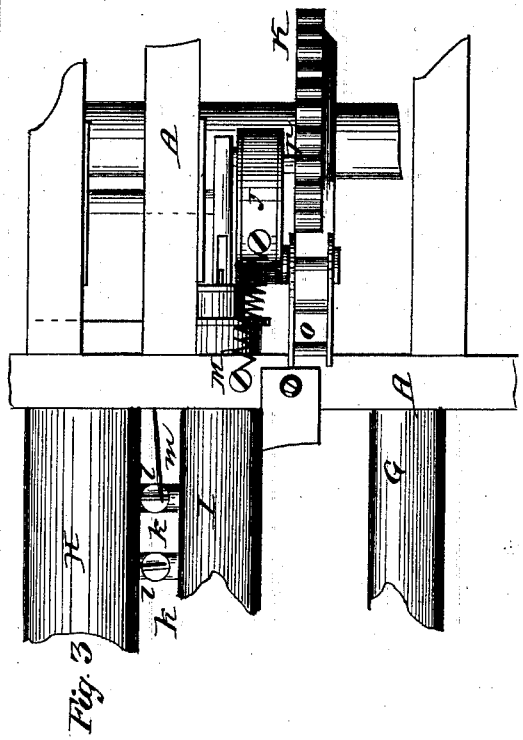

Fig. 3

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UNITED STATES PATENT OFFICE.

WILLIAM H. LYNN AND CHARLES C. SNYDER, OF FREEPORT, ILLINOIS.

IMPROVEMENT IN CAR-STARTERS.

Specification forming part of Letters Patent No. **206,590**, dated July 30, 1878; application filed June 20, 1878.

To all whom it may concern:

Be it known that we, WILLIAM HENRY LYNN and CHARLES CARROLL SNYDER, of Freeport, in the county of Stephenson and State of Illinois, have invented certain new and useful Improvements in Car-Starters; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is an inverted plan view of our improved motor applied to a car. Fig. 2 is a sectional elevation, with the cylinder partly broken away to show the two-way cock or valve arranged between the compressed-air reservoir or holder and said cylinder, and with one of the starting-pawls swung back from its ratchet-wheel, showing a stud or projection upon a crank-arm of the cylinder piston-rod to support the said pawl with its ratchet-wheel when the motor is not in use; and Fig. 3 is a detailed plan of one of the piston-rods of the cylinder and its crank-arm.

The same part in the several figures is denoted by the same letter.

This invention relates to certain improvements in that class of motors particularly adapted for starting cars; and it consists in the employment of pendants or supports having the frictional rollers by which motion is transmitted from the car-wheels to the pump-pistons hung through their connecting-pieces and other suitable means from the truck-frame, and having springs to enable them to withdraw the frictional rollers from the car-wheels when desired, substantially as hereinafter more fully set forth.

In the drawing, A represents the truck-frame of a car having the ordinary hand-operating brake-shafts B B connected thereto in the usual way. These shafts are chained or otherwise connected at their lower ends to a centrally-pivoted lever, C, fulcrumed in a frame, *a*, or other suitable support depending from the truck-frame A. The lever C is connected, by rods or chains *b b*, to end pieces or bars *c c*, which are connected to the crank-shaft bearings or supports, which shaft is provided with frictional wheels or rollers, to be presently further referred to.

D D are crank-shafts, supported or hung in bearings *d d*, fastened at their upper ends to bars *e e*, hung by means of staples or otherwise from plates *f f*, secured to frame A, to permit of their having a limited movement, in order that the wheels or rollers E E, fastened to said shafts, may have a movement toward and from the car-wheels F F by turning the upright hand-crank shafts B B.

From the crank-shafts D D of the frictional rollers or wheels E E extend connecting-rods *g g*, strapped to said shafts and jointed to the piston-rods *h h*, whose pistons fit and work in a double-acting air-compressing pump, G, supported in suspenders fastened to the frame A. To one side of the pump G are supplied air-ingress pipes or tubes *i i*, one at each end thereof and a third one about equidistant between the end tubes.

The air from the pump G is pumped into the air holder or reservoir H, suitably supported in position upon the lower side of the frame A through the tubes or pipes *j j*, preferably four in number, to obtain the greater supply of air, and connecting the pump and reservoir together.

I is an air-cylinder suspended to the lower side of the frame A, and connected with the air holder or reservoir H by pipes *k k*, having a two-way cock or valve, *l*, from which extends a rod, *m*, connecting with a hand-operating lever, *n*, fulcrumed at the front end of the car or truck frame A, and extending up within convenient reach of the driver. This arrangement of parts may be duplicated for the operation of a second similar cock or valve in the other tube or pipe, extending to and for applying the starter from the other end of the car.

When the passage between the cylinder and reservoir is opened to admit air to the cylinder to start the car the discharge-passage is closed, and by reversing the movement of the valve or cock the passage between the cylinder and reservoir is closed, and the discharge-passage caused to act as an exhaust for the cylinder, the springs forcing the pistons back to their normal position.

The cylinder I is provided with two pistons, which are connected to two crank-arms, J J,

having pawls *o o* pivoted thereto, which engage ratchet-wheels K K upon the car-wheel axles L L. The crank-arms J J are returned to their normal position, after having been acted upon by the pistons of the cylinder I, by the springs M M, connected at one of their ends to the upper ends of said arms and at their other ends to the frame A.

From the sides of these arms or cranks next to their pawls extend projections or studs *p p*, upon which to support the said pawls with the ratchet-wheels K K when the starter is not being applied.

The operation is as follows: In stopping the car the brake-shaft B, as is usual, is turned, applying the frictional rollers or wheels E E to the car-wheels, which will tend to retard the motion of the latter, and at the same time partake of the motion of the same and transmit it to their crank-shafts D D. The motion or turning of the shafts D D will, in turn, work the double-acting pump-pistons, and thus charge or fill the reservoir or holder H with compressed air in readiness for use upon starting the car. When the car is to be started the two-way cock or valve *l* is opened by the driver turning its operating-lever *n* so as to discharge the compressed air of the holder or reservoir H into the piston-cylinder I. When this takes place its pistons will be acted upon in such a manner as to carry the crank-arms J forward, and with them the pawls *o o*, the said arms moving downwardly sufficiently to allow their studs *p p* to be freed from and let the pawls enter the teeth of the ratchet-wheels K, when, it will be seen, the car-axles and their wheels will receive a forward movement, thus starting the car. After starting the car the two-way cock or valve is reversed, so as to cut off the air from the cylinder I, or cut off the passage of the inrushing air of the air-holder H from the cylinder I.

By the action of the springs M at this juncture the crank-arms J J will be returned to their normal or an elevated position, when their studs *p* will throw up the pawls *o o* from the ratchet-wheels K K, and thus permit the latter to revolve with the car-wheel axles without interference with or injury to the starting mechanism.

The pawls, instead of being connected to the pistons by cranks, may be connected directly thereto by a hinge-joint, and a direct pushing movement thus imparted to the ratchet-wheels. The springs M may be arranged upon the pistons and the same effect be produced.

Having thus described our invention, we claim and desire to secure by Letters Patent of the United States—

The combination, with the operating crank-shafts D of the frictional rollers E by which motion is transmitted from the car-wheels to the air-pump pistons and its piston-rods, of the hinged or pivoted pendants *d*, having the springs *d'* to enable them to withdraw the frictional rollers from the car-wheels, substantially as and for the purpose set forth.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in presence of two witnesses.

WILLIAM HENRY LYNN.
CHARLES CARROLL SNYDER.

Witnesses:
J. C. BOYNTON,
J. H. STAVER.