2 Sheets—Sheet 1.

H. SCHREINER.

CAR-STARTER.

No. 191,890. Patented June 12, 1877.

FIG. 1

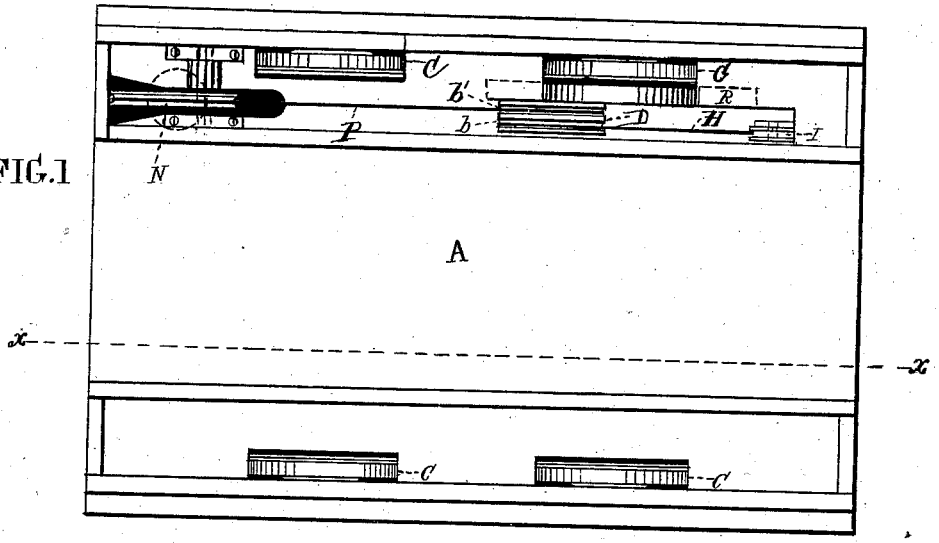


FIG. 2

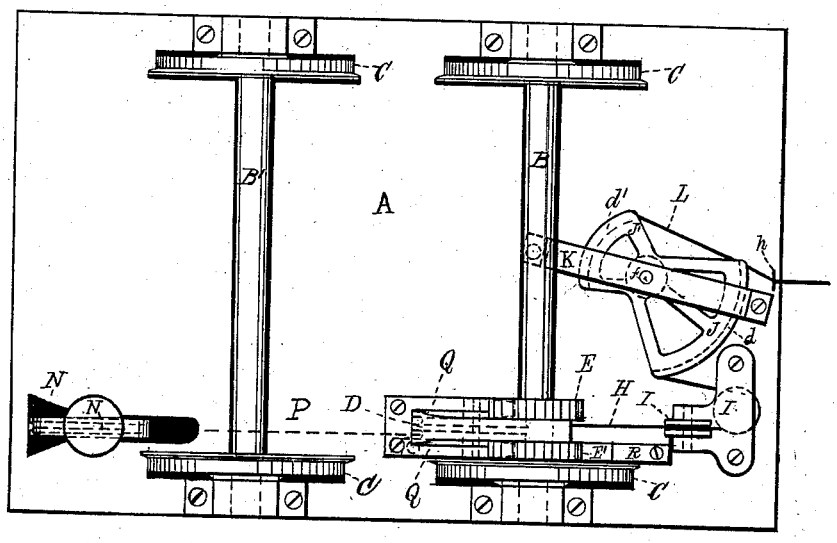
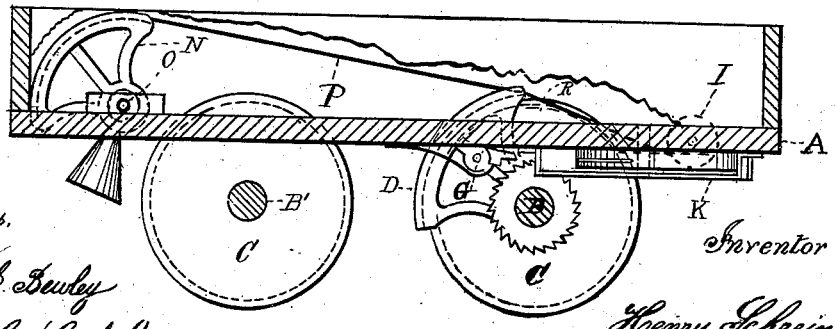


FIG. 3



Witnesses,

Thomas J. Bewley

George C. Hebel

Inventor

Henry Schreiner

per Stephen Ustick Attorney.

2 Sheets—Sheet 2.

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CAR-STARTER.

No. 191,890. Patented June 12, 1877.

FIG. 4

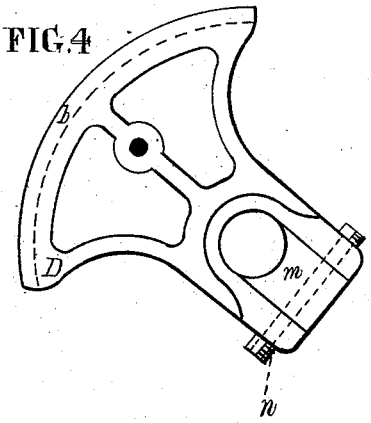


FIG. 5

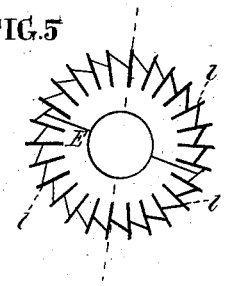


FIG. 6

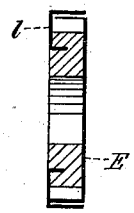


FIG. 7

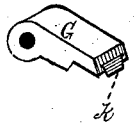


FIG. 8

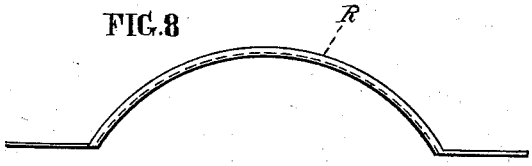
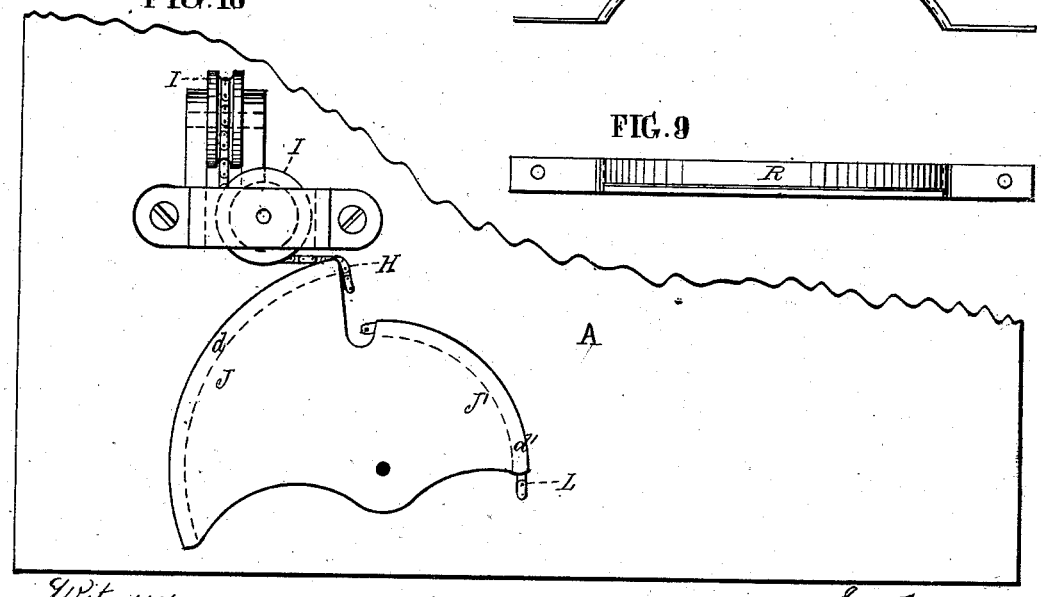


FIG. 10

FIG. 9



Witnesses

Thomas J. Dewey.

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Inventor

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per Stephen Ustick Attorney

UNITED STATES PATENT OFFICE.

HENRY SCHREINER, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN CAR-STARTERS.

Specification forming part of Letters Patent No. **191,890**, dated June 12, 1877; application filed January 2, 1877.

To all whom it may concern:

Be it known that I, HENRY SCHREINER, of the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Car-Starters, which improvements are fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 is a top view of a car-bottom having my improvements attached. Fig. 2 is a bottom view of the same. Fig. 3 is a vertical longitudinal section, taken through line *x x* of Fig. 1. Fig. 4, Sheet No. 2, is a side view of the lever D on an enlarged scale. Figs. 5 and 6 are a like view and cross-section of the ratchet-wheel E. Fig. 7 is an isometrical view of a pawl, G. Figs. 8 and 9 are side and edge views of the shield R. Fig. 10 is a modified form of the double sector J J′.

Like letters of reference in all the figures indicate the same parts.

My invention, in the first place, relates to a sector-lever which fits loosely on the front axle between two ratchet-wheels, which are permanently connected with the axle in combination with a double sector, parallel with and beneath the bottom of the car. The double sector has a groove in each arc, one for the the draft chain or rope, and the other for a chain, rope, or belt, and which connects the sector with the above-mentioned sector-lever, the said connecting-chain passing over suitable pulleys to form the connection. When the draft chain or rope is pulled forward by the horses in starting, the sector-lever, by means of its connection with the double sector, as described, is turned partly around to assist in starting the car, the lever being provided with pawls, (one on each side,) which engage with the ratchet-wheels above mentioned, so as to start the movement of the traction-wheels. In order that the double-tree may not be drawn forward from the car more than about fourteen inches while the car is moved forward about twenty-one inches, the end of the sector to which the draft-chain is attached is about one-third shorter than the other end, to which the connecting-chain of the two sectors is attached. The sector remains in its forward position until the traces are slackened by the stopping of the horses, or running down grade; then the sector has a backward movement given to it by means of a counter-weight, arranged in any convenient manner, the lever turning freely on the axle, so as to come into the proper position for the next starting of the car.

A is the bottom of a street-car. B is the front axle, and B′ the rear axle. C C are the traction-wheels. D is a sector-lever which fits loosely on one end of the front axle B, between ratchet-wheels E and E′. The lever D is provided with pawls G G, which are hung to its sides by means of the pin *a*. The lever has grooves *b b′* in its periphery to receive chains, ropes, belts, or wires. The groove *b* receives the chain H, one end of which is fastened to the rear edge of the lever. The said chain is passed around the pulleys I I, (seen in Fig. 2,) and lies in the groove *d*, in the long end of the double sector J J′, which works on the fulcrum-pin *f*, the upper end of which is fast in the bottom A of the car, and the other end held by the bow K, which is fastened to the lower side of the bottom of the car. The draft-chain L is held in the groove *d′*, in the periphery of the short sector J′, one end of the chain being fastened to the rear edge of the sector, and the other passed through the eye of the bolt *h*, or between two rollers. The front end of the chain L is connected to the double-tree, (not seen in the drawings.) In order to cause the double-tree to move forward in front of the car only about fourteen inches while the car advances about twenty-one inches, the short sector J′, to which the draft-chain is attached, is one-third shorter than the sector J, which connects with the starting sector-lever D.

I do not confine myself to the size or proportions of the sectors, as above stated, as they may be varied to suit the size and shape of the car, or the distances to be moved on the track. When the lever is drawn to its forward position by the movement of the double sector acting upon it by means of the connecting-chain H, the pawls G G are disengaged from the ratchet-wheels E and E′, and the lever is brought back to its former position (seen in the drawings) by means of the weighted sector N, on the shaft O and the rope P, one end of which is fastened to the sector, and the

other end to the front edge of the lever, the chain lying in the groove *b'*. As this function may be readily performed by some other device, I do not confine myself to the use of the counter-weight.

As the lever arrives in this position, the pawls are drawn onto the resilient ends of the springs Q Q, to elevate them above the ratchet-wheels, and thus admit of the backward movement of the car. I do not confine myself to the form of the double sector as shown in the drawings, as various forms are necessary according to the position in which the directing-pulleys may have to be placed, governed by any difference in the construction of the car, one of which is shown in Fig. 10.

To prevent the pawls G G rattling in their backward movement over the ratchet-wheels E E', a strip of leather or india rubber, or a piece of wood, K, or other soundless material, is connected by means of a dovetail groove with the lower edge of each pawl G, as seen in Fig. 7, or the strips may be fastened by means of screws, or in any other convenient manner. A similar result may be accomplished by means of bent wires *l*, connected with the ratchet-wheels, as seen in Fig. 6, so arranged as not to be in the way of the action of the pawls, and so that the latter may slide on them in their backward movement.

The ratchet-wheels E and E' are made in halves, for conveniently connecting them with the axle B; and for conveniently connecting the sector-lever D with the axle, I make it with a detachable block, *m*, held by means of a bolt, *n*, as seen in Fig. 4. Instead of the block an ordinary cap may be used.

To prevent mud or dirt falling on the ratchet-wheel E' from the upper edge of the contiguous traction-wheel C, I connect the shield R with the bottom of the car, as seen in the drawings. The shield is shown in detail in Figs. 8 and 9.

I claim as my invention—

1. The combination of the sector-lever D, chain H, guide-pulleys I I, double sector J J', and draft-chain L, substantially in the manner and for the purpose set forth.

2. The soundless strip K, connected with the under side of the pawls G G, substantially as and for the purpose set forth.

3. The weighted sector N, having a rope, P, in combination with the sector-lever D, for giving a reverse movement to the lever, substantially as set forth.

HENRY SCHREINER.

Witnesses:

THOMAS J. BEWLEY,

STEPHEN USTICK.