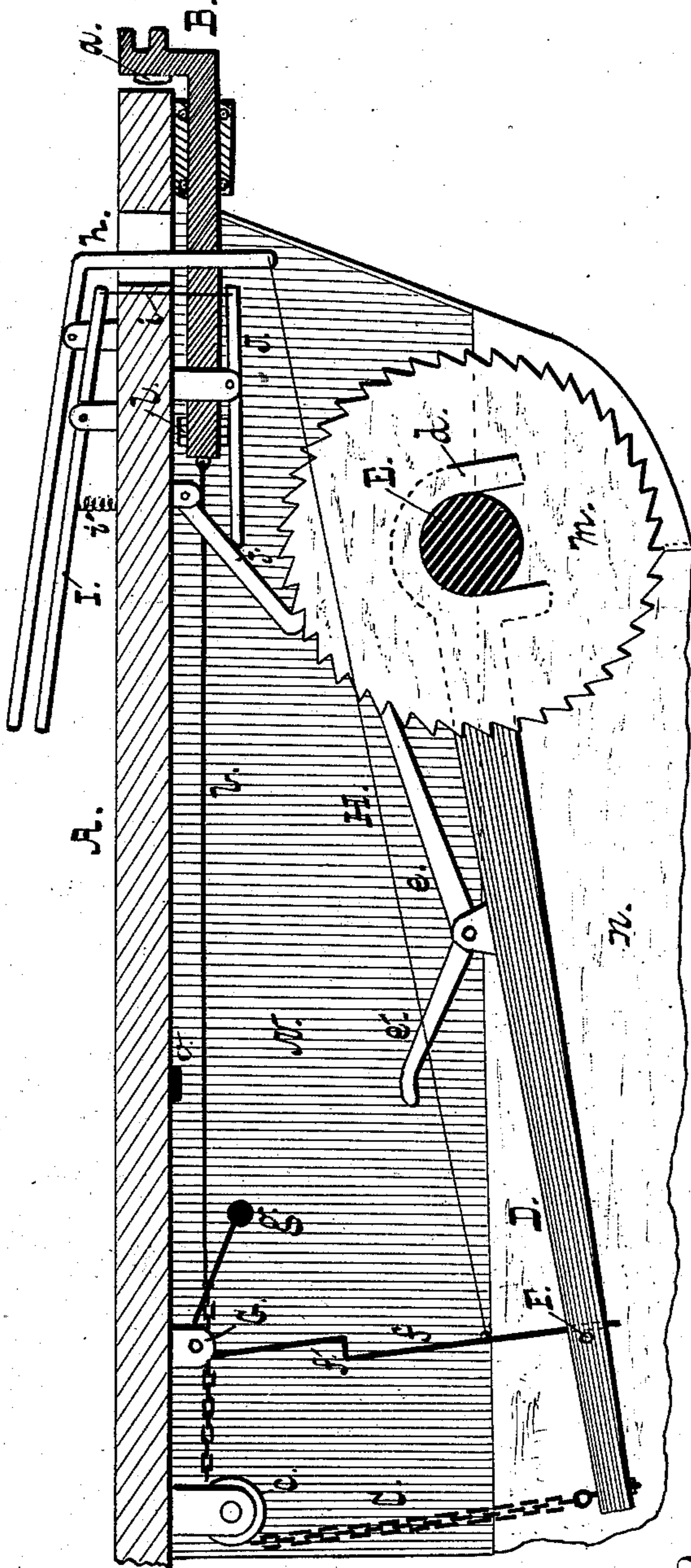


(No Model.)

B. G. FITZHUGH  
Car Starter.

No. 237,264.

Patented Feb. 1, 1881.



Witnesses,  
W. A. Bertram.  
*W. A. Bertram*

Inventor,  
B. G. Fitzhugh.

by

*R. Williams*  
Attorney.

# UNITED STATES PATENT OFFICE.

BENJAMIN G. FITZHUGH, OF BALTIMORE, MARYLAND.

## CAR-STARTER.

SPECIFICATION forming part of Letters Patent No. 237,264, dated February 1, 1881.

Application filed November 30, 1880. (No model.)

*To all whom it may concern:*

Be it known that I, BENJAMIN G. FITZHUGH, of Baltimore city, State of Maryland, have invented certain new and useful Improvements in Car-Starters; and I hereby declare the same to be fully, clearly, and exactly described as follows, reference being had to the accompanying drawings, in which the said device is illustrated in side elevation, partly in section.

My present invention is in the nature of an improvement upon that for which Letters Patent were granted me November 9, 1880, No. 234,121; and it has for its object to simplify the construction of the car-starting mechanism, to increase its efficiency, to lessen the noise, and to combine with the said mechanism a trigger for holding the starting-pawl out of gear, and a locking-pawl, which latter subserves a most important end.

In the case of vehicles (and this is especially true of street-cars, whether equipped with starters or not) being stopped on an upgrade, it is necessary for the driver to set the brakes to prevent the vehicle from running back, and to release the brakes as soon as, in his judgment, the draft of the team is great enough to start the vehicle. Obviously, a draw-bar starter will not return to cause its pawl to engage with the ratchet while there is any material draft upon it, so that the application of the brakes in stopping on a grade is an absolute necessity if the aid of the starter is to be invoked in moving the car. It will not do at all to allow the pawl to engage as soon as the car comes to rest, and then permit the car to run back to the extent permitted by the draw-bar, as such a course would inevitably result in the destruction of the starter. It could not be practically constructed strong enough to stand the strain and jar. Besides this, it would be very difficult to make the team back at the precise moment that the car comes to rest, as would be necessary in order to allow the draw-bar to return, and the clicking and noise of the pawl would be very annoying. I obviate this by providing the pawl-lever with a trigger which holds the pawl out of gear, and by adapting an independent pawl to the ratchet, which locks the latter the instant the car comes to rest and allows the lever to drop. Both

trigger and pawl are operated by foot-levers mounted on the front platform.

In the drawings, A is the bottom of the car; B, the draw-bar, having buffers *a l*, which bring up, respectively, against the car-front and the draw-bar sleeve and prevent noise. A ratchet, *m*, is keyed on the axle E, and D is the lever, carrying a bent lever-pawl, *e*, that engages with the ratchet. The front end of the lever is bifurcated and embraces the axle, having jaws *d*, as shown. C is the chain, which passes over a pulley, *c*, and is attached to the draw-bar by means of a rod, *b*. The trigger *f* is pivoted at G and carries a counterpoise, *g*, the effect of which is to cause the lower end of the trigger to press against the pin F on the lever D. The trigger has a shoulder, *f'*, that engages the pin F when the lever D is raised. H is a rod connecting the trigger with a foot-lever, *h*, that is pivoted above the front platform, as shown. A second pawl, *j*, is pivoted beneath the car, and is adapted to engage with the ratchet *m*, but is normally held out of gear by means of a lever, J, that is connected with a second foot-lever, I, by a rod, *i*. A spring, *i'*, or a counterpoise on the front end of the lever I, serves to normally depress the said end and hold the pawl *j* out of gear with the ratchet. The entire mechanism beneath the car is inclosed in a casing, N, having its lower portion, *n*, formed of canvas or equivalent fabric, the design being to protect the mechanism from dirt or dust, while not inclosing it below in a rigid box, which would be liable to be injured by stones or inequalities of the road-bed. Such is the construction of the device.

In operation, as the bar B is drawn forward, the pawl *e* engages the ratchet and enforces a partial revolution of the axle, starting the car. As the lever rises the arm *e'* of the pawl abuts against the under side of the car at a point, by preference, armed with a rubber cushion, *o*, to prevent noise, and throws the pawl out of engagement with the ratchet. A slight further rise of the lever allows the shoulder *f'* to fall beneath the pin F, when the lever is securely held in its raised position. When the car is stopped on an upgrade the driver depresses the end of the lever I as the car comes to rest, causing the pawl *j* to engage with the ratchet

*m*, preventing the reverse rotation of the axle. On depressing the lever *h* the trigger *f* is drawn forward, allowing the lever *D* to fall into position for starting the car. As the car moves  
5 forward, the strain is taken off the pawl *j*, which rises automatically. The parts are shown in the accompanying drawing in the position they occupy just previous to the starting of the car.

By the described device a great relief is afforded as well to the driver as to the team.  
10 No necessity exists for using the brakes on an upgrade, except it be desired to stop the car quickly. They need not be held to the wheels after the car comes to rest, and all the strain-  
15 ing and tugging of the team against the resistance of the car, too frequently augmented by the brakes as now used, are obviated. Be the driver never so careful, he is bound to hold the car until the draft will start it, (and in  
20 practice this point is necessarily exceeded more or less,) or if he does not he will find the vehicle running downgrade in spite of his team. In either case the force absolutely required to start the car in opposition to gravity alone is  
25 greatly exceeded.

What I claim is—

1. In a car-starter, a ratchet mounted upon the axle, in combination with a lever carrying a pawl that is automatically thrown out of gear  
30 as the lever is raised, and a second pawl adapted, as the car comes to rest, to lock the ratchet and permit the lever to fall, as set forth.

2. In a car-starter, a ratchet mounted on the axle, in combination with a lever carrying  
35 a pawl that is automatically thrown out of gear as the lever is raised, and a trigger or catch for retaining the lever in its raised position, as set forth.

3. In a car-starter, a ratchet mounted on the axle, in combination with a lever carrying a  
40 pawl that is automatically thrown out of gear as the lever is raised, and a trigger or catch for retaining the lever in its raised position, and a second pawl, normally out of gear with the ratchet, but adapted to engage it as the  
45 car comes to rest, as set forth.

4. In combination with the ratchet, lever, and bent lever-pawl, the counterpoised trigger  
*f* and operating mechanism, as set forth.

5. The combination of a ratchet mounted on  
50 the axle, a pawl pivoted to the car-body, and mechanism for holding the pawl out of gear with the ratchet, and for causing it to engage therewith as the car comes to rest, as set forth.

6. In combination with the ratchet mounted  
55 on the axle, the pawl *j*, pivoted to the car-body, and a foot-lever above the platform adapted, by means of intermediate mechanism, to operate the pawl, as set forth.

7. In a car-starter, the combination, with the  
60 ratchet, lever *D*, pawls, and draw-bar, of the levers *h* *I* and trigger *f*, as set forth.

8. In combination with the draw-bar and sleeve, the buffers *a* *l*, adapted to cushion the  
65 strokes of the draw-bar, as set forth.

9. A car-starter mechanism inclosed in a casing having its lower portion constructed of canvas or equivalent yielding material, where-  
by injury to the same from inequalities of road-  
bed is avoided, as set forth.

BENJAMIN G. FITZHUGH.

Attest:

R. D. WILLIAMS,  
C. H. ARMSTRONG.