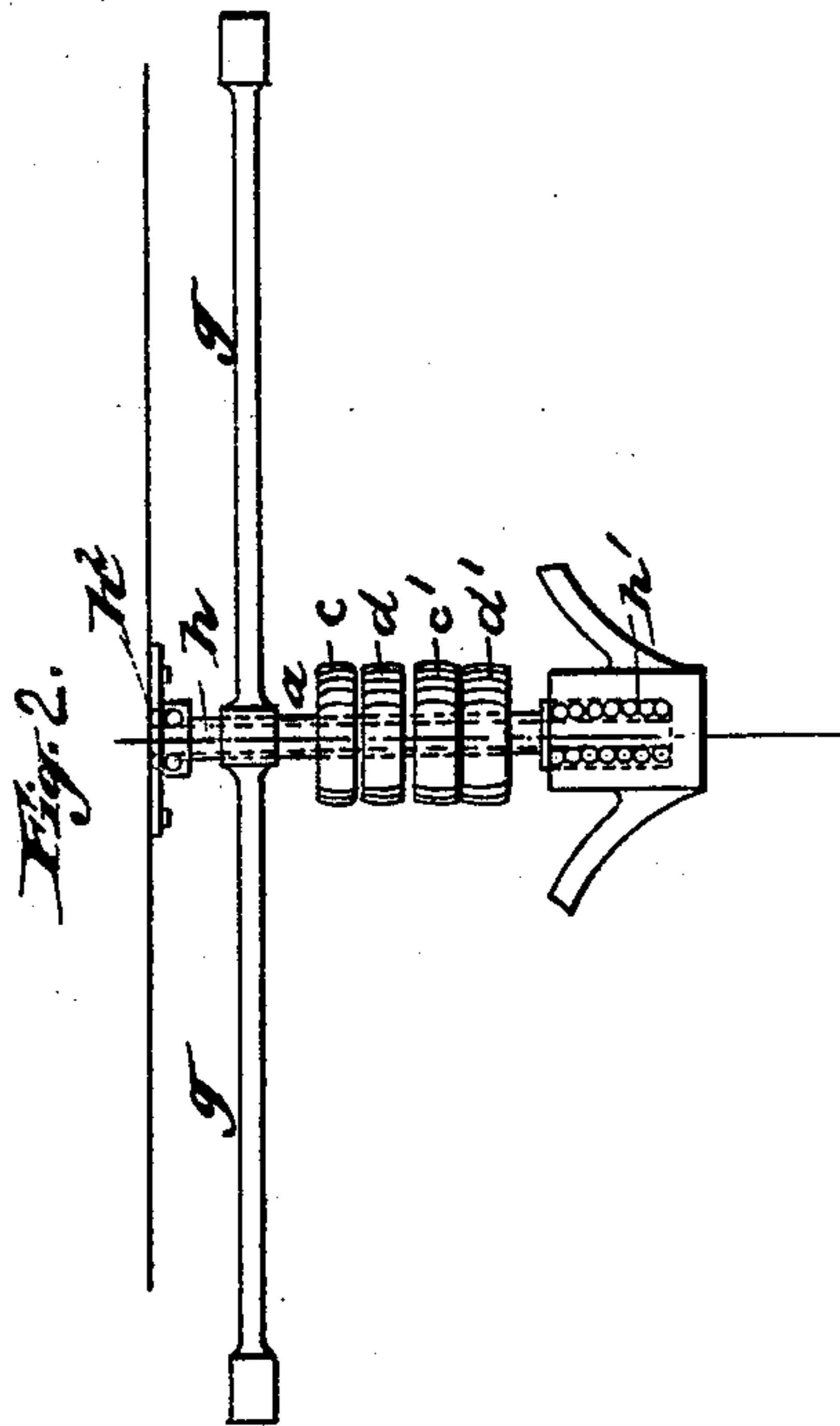
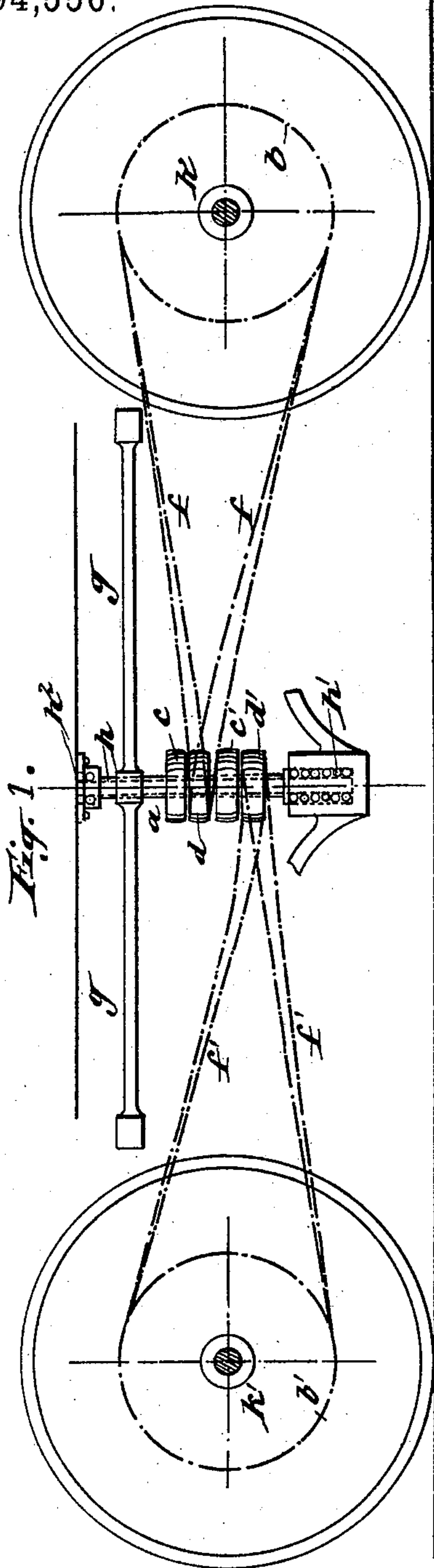


(No Model.)

A. PRIM.  
CAR STARTER.

No. 594,556.

Patented Nov. 30, 1897.



WITNESSES:

Wm. D. Bell.  
L. Snyder.

INVENTOR:

Arthur Prim  
by *Eastman & Co. Attys*

# UNITED STATES PATENT OFFICE.

ARTHUR PRIM, OF BRUSSELS, BELGIUM.

## CAR-STARTER.

SPECIFICATION forming part of Letters Patent No. 594,556, dated November 30, 1897.

Application filed May 25, 1897. Serial No. 638,015. (No model.)

*To all whom it may concern:*

Be it known that I, ARTHUR PRIM, a citizen of Belgium, residing in Brussels, in the Kingdom of Belgium, have invented certain new and useful Improvements in Car-Starters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and the letters of reference thereon, which from a part of this specification.

The object of this invention is to utilize the momentum of a street-car or of other vehicles; and it consists in the combination and arrangement of the various parts, substantially as will be hereinafter more fully described and finally embodied in the clauses of the claim.

In the accompanying drawings, Figure 1 is a side elevation of a street-car provided with my improvement, only those parts of the car being shown which are necessary to fully illustrate the nature of my said invention; and Fig. 2, a detail view of the auxiliary shaft and the fly-wheel and pulleys carried thereby.

On the axles  $k$  and  $k'$  of the car are mounted the pulleys  $b$  and  $b'$ , respectively, which latter transmit their motion through endless belts  $f$  and  $f'$  to a series of pulleys  $c$ ,  $d$ ,  $c'$ , and  $d'$ , arranged on the vertical shaft  $h$ . Said shaft is mounted in ball-bearings  $h'$  and  $h''$ , arranged in brackets, suitably supported on the car or its truck. The pulleys  $d$  and  $d'$  are loosely arranged on said shaft  $h$ , while the pulleys  $c$  and  $c'$  are securely mounted thereon.

A fly-wheel  $g$  is securely mounted on the shaft  $h$  and is adapted to be driven or operated from the axles  $k$  and  $k'$  by means of the pulleys and belts heretofore described.

The proportional sizes of the pulleys  $b$  and  $b'$  to the fixed and loose pulleys on the shaft  $h$  may be as desired—for instance, be three to one, so that the speed of the shaft of the fly-wheel will be three times as great as that of the wheel-axles.

It may also be pointed out that the loose pulleys  $d$  and  $d'$  are preferably provided with ball-bearings, so as to diminish the friction on the shaft  $h$ .

The fly-wheel is preferably made of such shape that the greater part of its weight is in its rim.

The operation is as follows: While the car is in motion, the cross-belts are on the pulleys  $c$  and  $c'$ , which actuates the fly-wheel, thus acquiring a great velocity. When stopping, the driver shifts the belt on the loose pulleys, yet the fly-wheel continues to rotate. When the car is being started, the belt is again shifted upon the fixed pulleys and the force accumulated in the fly-wheel assists in starting the vehicle—that is to say, at this moment the fly-wheel and the fixed pulleys drive the pulleys  $b$   $b'$ , secured on the axles  $k$   $k'$ . It will be seen that the engagement and disengagement of the parts are extremely easy and that the momentum of the car, which hitherto has never been utilized in an efficient manner, is in this case accumulated in the rotating fly-wheel, which can be in a very easy manner thrown in or out of the gear with the axles, and thus help to start the vehicle without sensibly increasing the weight of the car. Of course the transmission of movement from the axles to the shaft of the fly-wheel may be effected in other ways than by means of belts.

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

1. A starting device for tram-cars and other vehicles consisting of a vertically-arranged shaft, a fly-wheel carried by said shaft, a series of fixed and loose pulleys mounted on said shaft, pulleys mounted on the axles of the tram-cars, and belts connecting said last-mentioned pulleys with the fixed and loose pulleys on the vertically-arranged shaft respectively, substantially as and for the purposes described.

2. The combination with a tram-car and its axles, of a pulley secured on each of said axles, a vertical shaft between said axles and suitably supported on the tram-car, a fly-wheel mounted on said shaft, a series of fixed and loose pulleys arranged on said shaft, and belts connecting said pulleys with the pulley on the axles of the tram-car, substantially as and for the purposes described.

In testimony whereof I have set my hand in the presence of the two undersigned witnesses.

ARTHUR PRIM.

Witnesses:

ALFRED WUNDERLICH,  
GUILLAUME POHLEY.