

(No Model.)

W. MONTGOMERY.  
CAR BRAKE AND STARTER.

No. 343,594.

Patented June 15, 1886.

Fig. 1

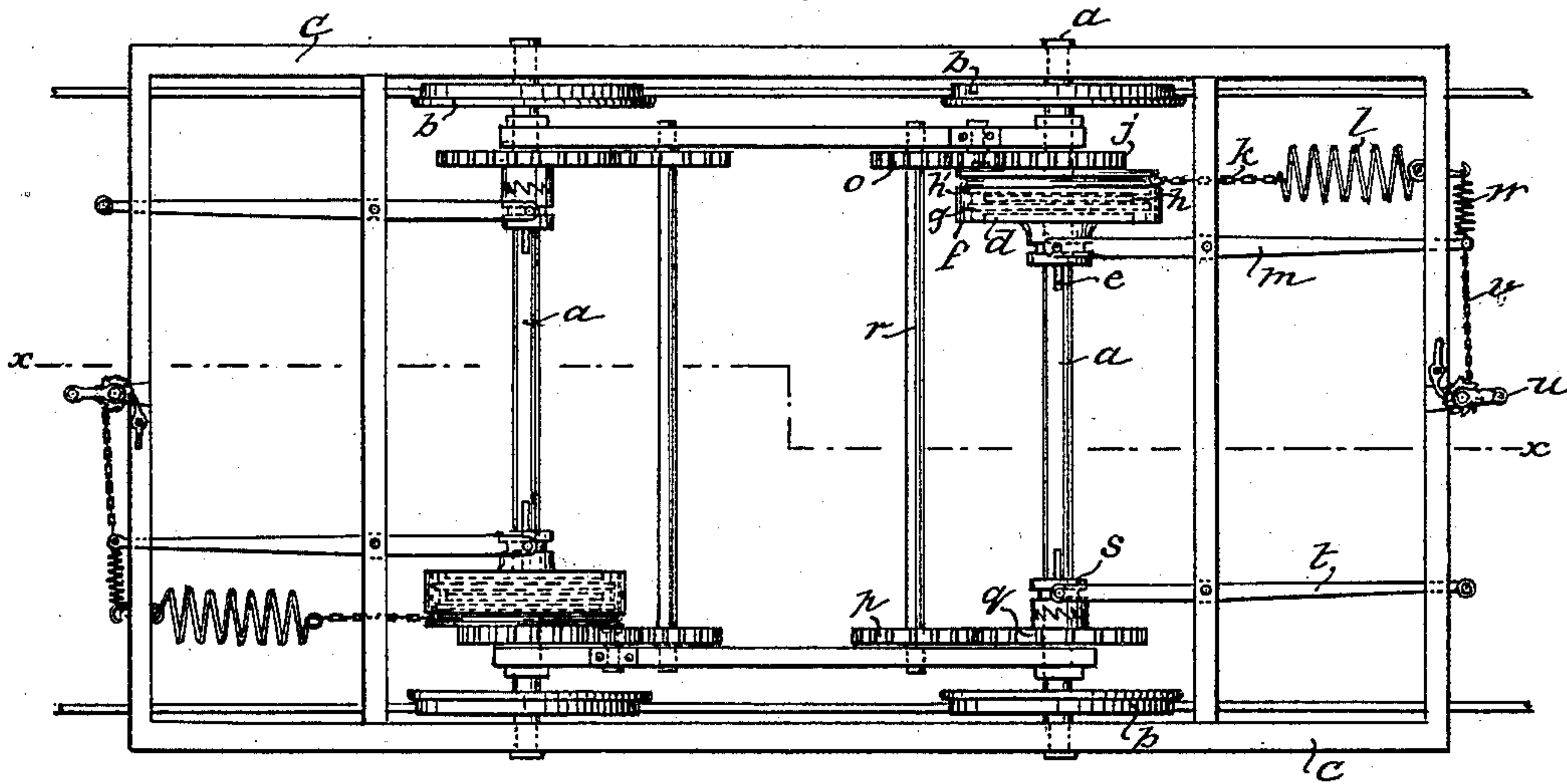


Fig. 2.

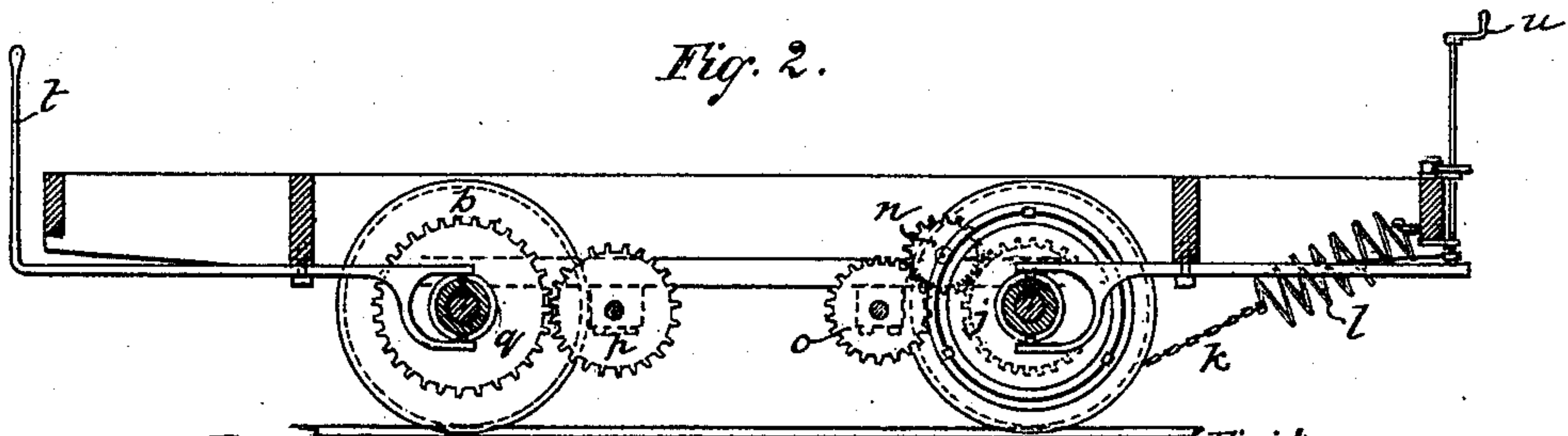


Fig. 5.

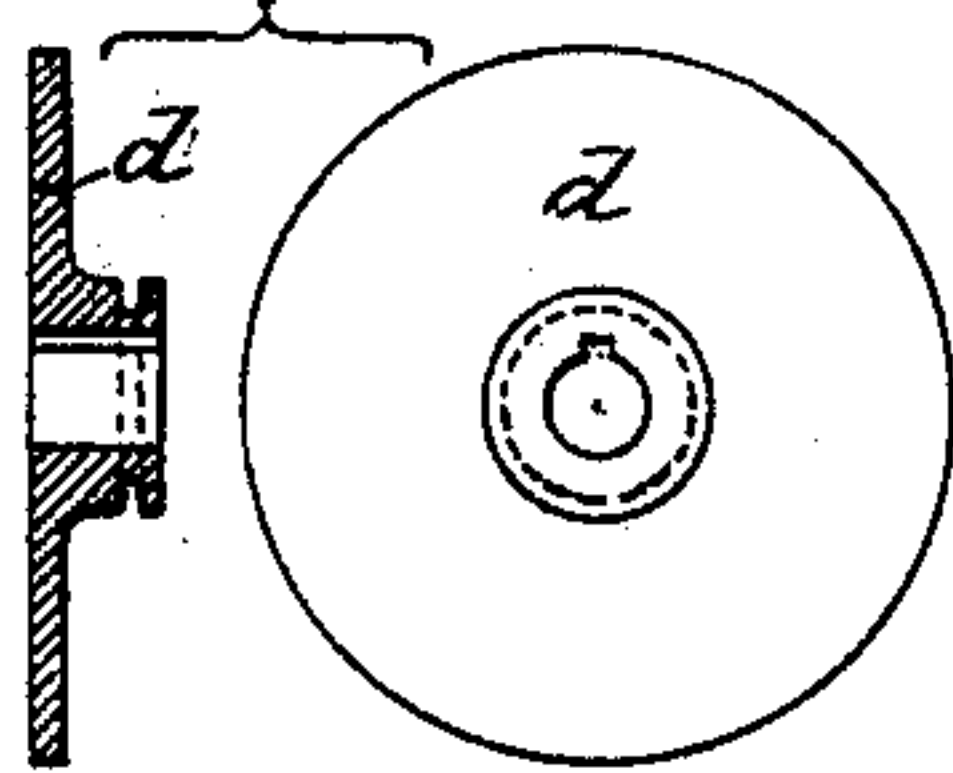


Fig. 3.

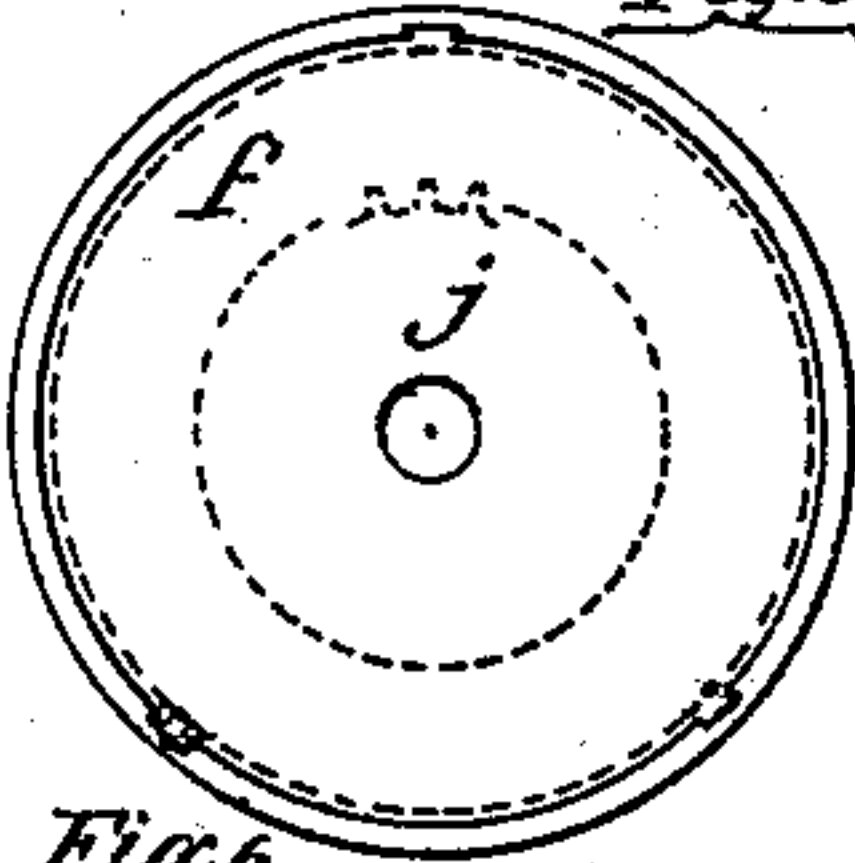


Fig. 4.

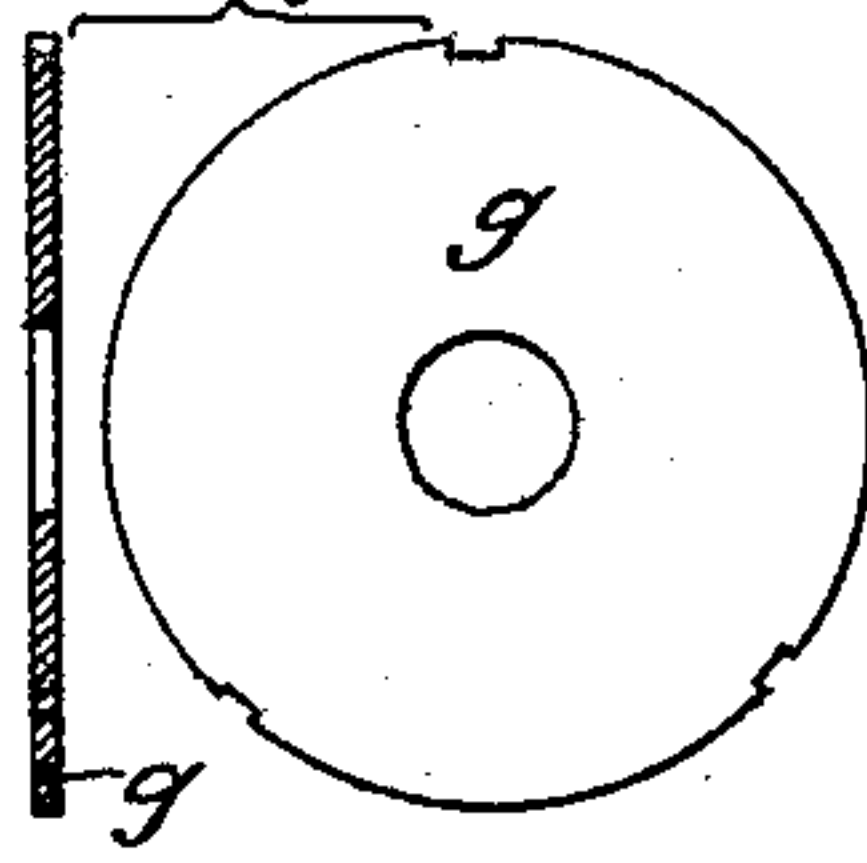
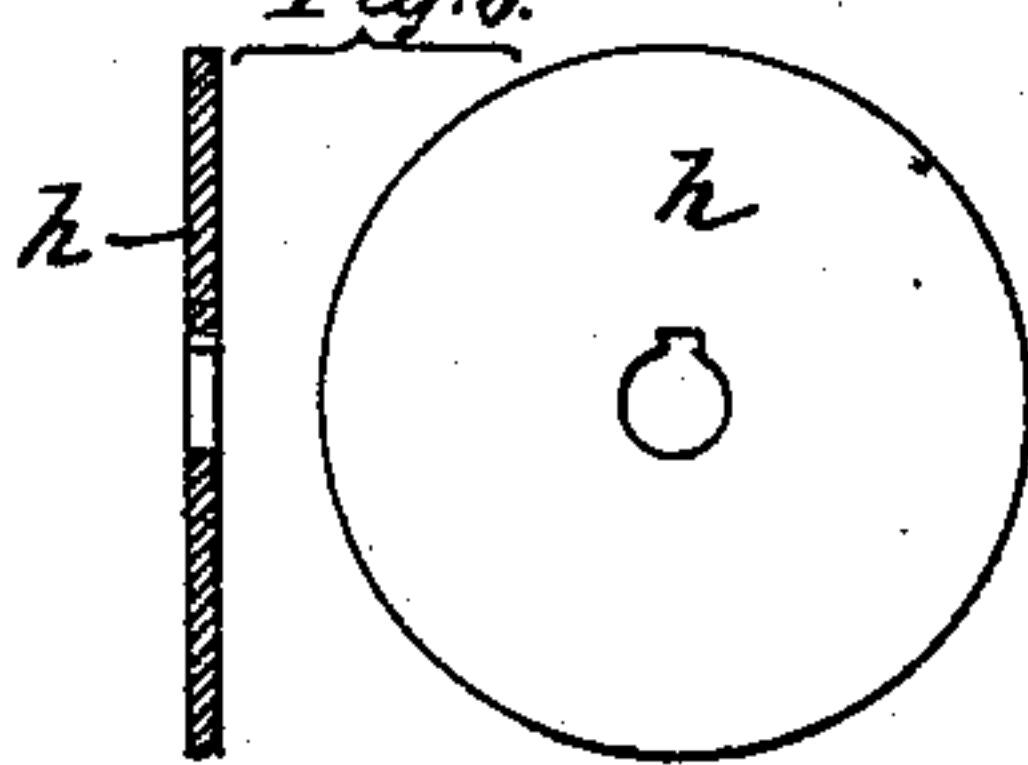


Fig. 6.



Witnesses:

Walter Storm  
Charles Bull

Inventor:

William Montgomery  
By Thomas & Bull  
Attys.



# UNITED STATES PATENT OFFICE.

WILLIAM MONTGOMERY, OF NEW YORK, N. Y.

## CAR BRAKE AND STARTER.

SPECIFICATION forming part of Letters Patent No. 343,594, dated June 15, 1886.

Application filed January 25, 1886. Serial No. 189,576. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM MONTGOMERY, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Car Brakes and Starters, of which the following is a description in such full, clear, concise, and exact terms as will enable any one skilled in the art to which my invention appertains to make and use the same, reference being had to the accompanying drawings, making part of this specification, and to the letters and figures of reference marked thereon.

Similar letters of reference indicate corresponding parts in all the figures of drawings.

In said drawings, Figure 1 is a plan view of a car-platform and running-gear with my invention applied thereto. Fig. 2 is a sectional elevation of the same on the line *x x*, Fig. 1. Figs. 3, 4, 5, and 6 illustrate detail parts of mechanism employed by me in carrying out the principles of my invention.

This invention consists of a novel car-brake, and in novel means for gathering up and storing energy developed from the momentum of the car when the brake is applied, which energy is to be subsequently liberated at will and utilized to aid in starting the car, and in the combination of such novel means, and in the devices and combination of devices by which said results are accomplished, as will be hereinafter fully set forth, as is illustrated in the drawings accompanying this specification, and as will be specifically indicated in the claims concluding this specification.

Referring to said drawings, *a* represents an axle of a car to which the wheels *b* are attached, and which revolves with said wheels. *c c* is the platform of a car in which said axle is journaled. *d* is a disk attached to said axle by a sliding key working in a longitudinal groove, *e*, cut in the axle, permitting said disk to slide longitudinally on said axle. Tilting loosely on said axle is another disk, *g*, keyed to a drum, hereinafter described; also, another disk keyed to the axle by a sliding key working in a longitudinal groove cut in the axle, substantially the same as the disk described, and another disk keyed to said drum, said disks standing side by side on the axle *a*, and all being free to slide longitudinally on said axle. A drum, *f*, to which the disks *i* and *g* are

keyed, also revolves loosely on said axle, and is provided with a gear-wheel, *j*, and has attached to it the chain *k*, connected with the spring *l*, fastened to the car-frame *c*. A lever, *n*, is provided at one end with a pin working in a groove on the axle of the disk *d*, and at the other end with a chain operated by an ordinary hand-brake crank or other means of applying power to draw it in one direction, and with a spring to return it to its initial position. The spindle of the hand crank is provided with an ordinary dog and ratchet to hold it in the position set. The cog-wheel *j* operates a train consisting of the wheels *n* and *o*, *p* and *q*, the wheels *o* and *p* both being fast on the connecting-rod *r*. The wheel *q* revolves loosely on the axle *a*, and has the face of its hub cut with ratchet-teeth meshing into the ratchet-teeth on a sleeve, *s*, fastened to said axle by a sliding key working in a longitudinal groove cut in said axle and revolving with it, but being free to move on it longitudinally. A sufficient number of disks, *a* and *g*, are placed alternately within the drum, and when forced together by means of the lever will cause friction on the axle that will arrest (or approximately arrest, as the case may require) the revolving motion of the car-wheels.

The operation of these devices may be briefly described, as follows: When it is desired to stop the car, the driver turns the crank *u* in the ordinary manner, winding up the chain *n* attached to it, and drawing the lever *m* against the pull of the spring *w*, thereby throwing the disk *d* free to move longitudinally on the axle, but revolving with said axle, hard up against the disk *g*, which is keyed to the drum *f*, but not to the axle. It also throws the disk *g* up hard against the disk *h*, which is keyed to the axle, but not to the drum. It also throws the disk *h* up hard against the disk *h'*, which is keyed to the drum, but not to the axle; hence, when the crank is operated as described, the disks *d*, *g*, *h*, and *h'*, alternately keyed to the axle and to the drum, respectively, are drawn hard up against each other, and the faces of the disks *d* and *h*, which are revolved with the axle, pressed against the faces of the disks *g* and *h'*, which are loose on said axle. The result of this is to communicate the energy revolving the disks *d* and *h* to the disks *g* and *h'*, and hence to the drum *f*, to which



they are keyed, revolving said drum and elongating the spring *l* connected thereto, and, as the resistance of said last-named spring increases, finally stopping the car. The disks are now in the position illustrated in Fig. 1.

When it is desired to start the car, the ratchet-teeth on the sleeve *s* are thrown in gear with the ratchet-teeth in the hub of the wheel *q*, as shown in Fig. 1. Then the dog is thrown out of connection with the ratchet-teeth in the spindle of the crank *n*, releasing the lever *m*, which is returned to its normal position by the retractile force of the spring *w*, and the disk *d* is moved on the axle away from the other disks, thereby releasing the drum, which is then revolved under the control of the spring *l*, and operates the gear *j n o p q*, the gear-wheel *q* being fast on the axle *a*. Thus the wheels are turned with a forward revolution and the car started. Now, when the car has been started, and the disks *g*, *h*, and *h'* are relieved of the pressure of the disk *d*, said disks separate a sufficient distance to permit the disk *h* to revolve freely and without friction between them. The sleeve *s* is then thrown out of gear, and the gear-train *j n o p q* ceases to travel, and remains at rest until brought into operation by the means hereinbefore described, thus relieving the car of all unnecessary friction while running.

In concluding this specification, I observe that any slight modification of the devices herein described may be made, or the substitution of other equivalent devices for those specified, so long as they do not alter the principle and purpose of the invention.

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

1. In a car brake and starter, a drum revolving loosely on a car-axle, connected with means for storing energy, combined with a series of alternate disks set upon said axle, free to re-

volve about and to slide longitudinally thereon and keyed to said drum, and a series of intermediate disks keyed to said axle, but free to slide longitudinally thereon, and means for bringing said series of disks in friction contact with each other, substantially as described.

2. In a car brake and starter, a drum revolving loosely on a car-axle, connected with means for storing energy, and also with the car-wheels through intermediate mechanism for the purpose of starting the car by means of such stored energy, combined with a series of alternate disks set upon said axle, free to revolve about and to move longitudinally thereon and keyed to said drum, and a series of intermediate disks keyed to said axle, but free to move longitudinally thereon, and means for bringing said series of disks in friction contact with each other, substantially as described.

3. In a car brake and starter, a series of alternate disks set upon a car-axle, free to revolve about and move longitudinally thereon, said disks being suitably keyed together, combined with a series of intermediate disks keyed to said axle, but free to move longitudinally thereon, means for bringing said disks in friction contact with each other, and means for storing energy, substantially as described.

4. In a car-brake, a series of alternate disks set upon a car-axle, free to revolve about and to move longitudinally thereon, said disks being suitably keyed together, combined with a series of intermediate disks keyed to said axle, but free to move longitudinally thereon, and means for bringing said disks in friction contact with each other, substantially as described.

WILLIAM MONTGOMERY.

Witnesses:

WM. H. RIBLET,

WM. MONTGOMERY, Jr.