

(No Model.)

2 Sheets—Sheet 1.

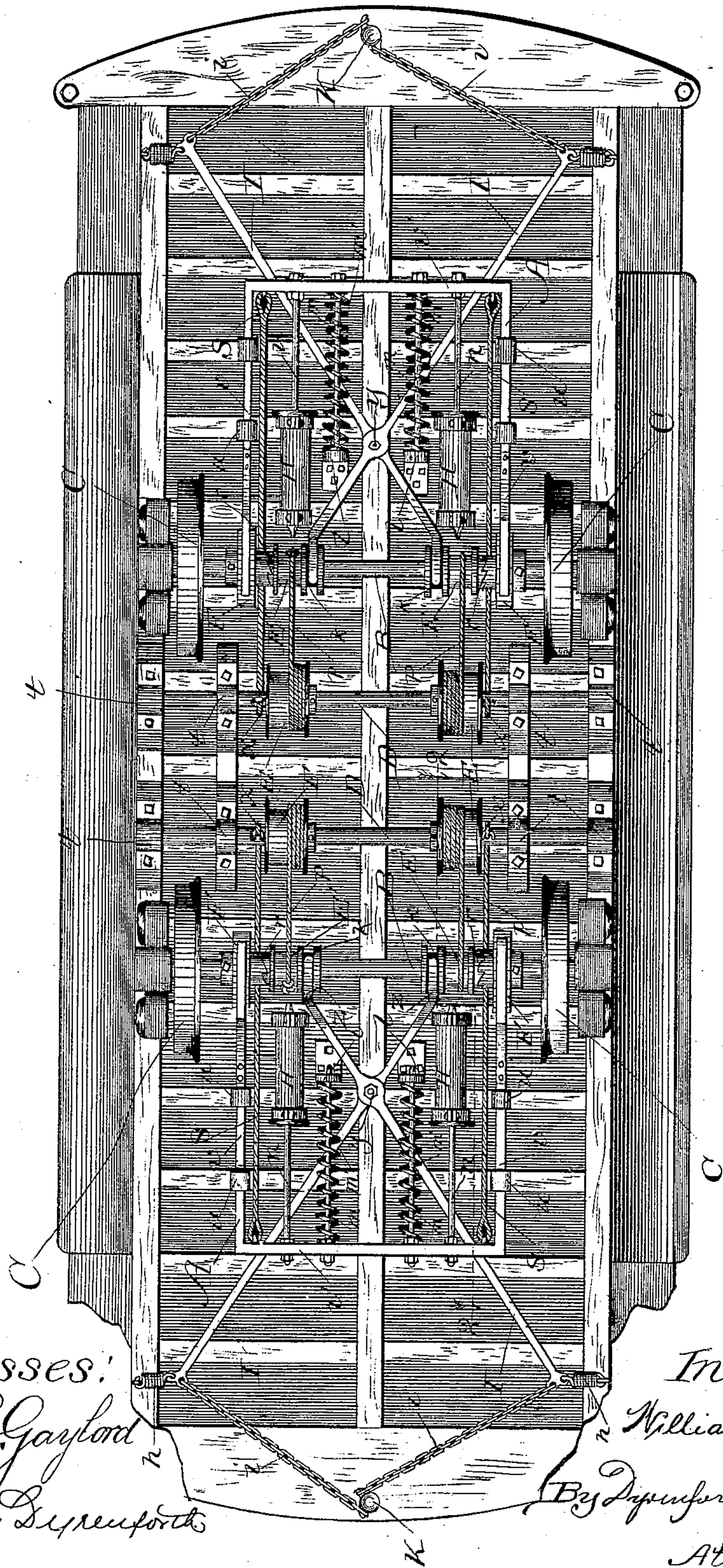
W. HANLEY.

CAR BRAKE AND STARTER.

No. 309,848.

Patented Dec. 30, 1884.

Fig. 1.



Witnesses:

Chas. E. Gaylord

Douglas D. S. S. S.

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(No Model.)

2 Sheets—Sheet 2.

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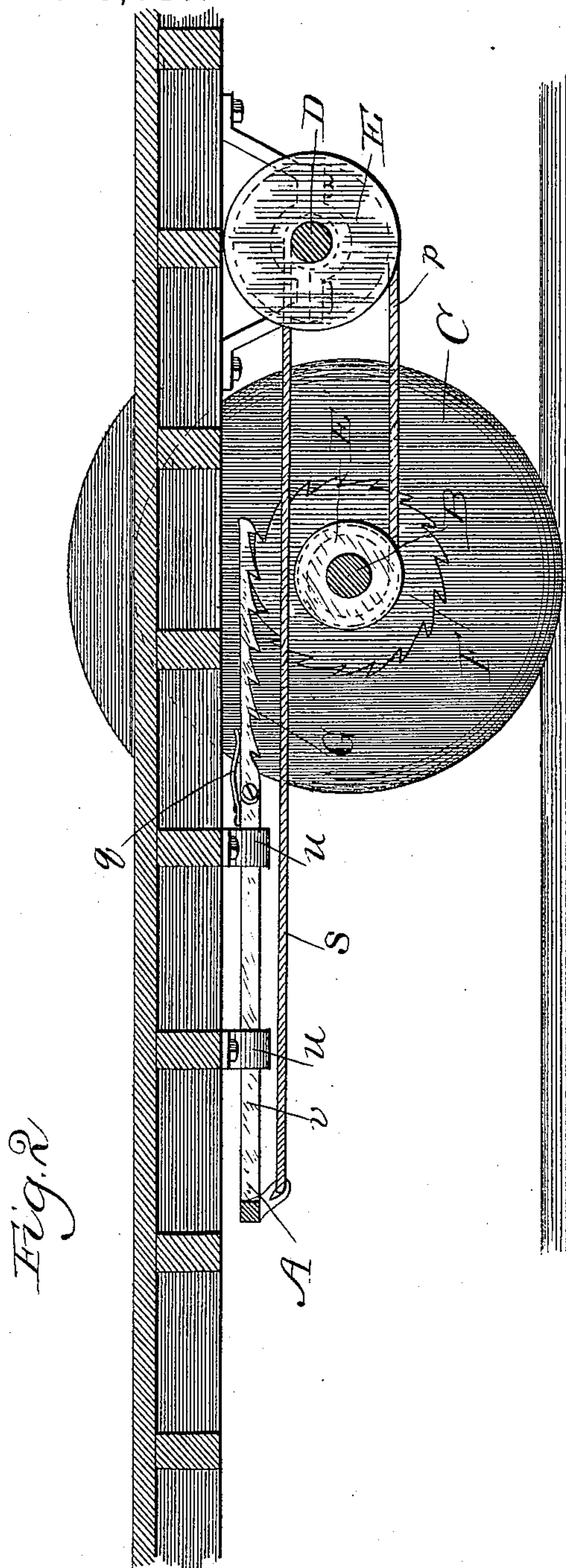


Fig. 2

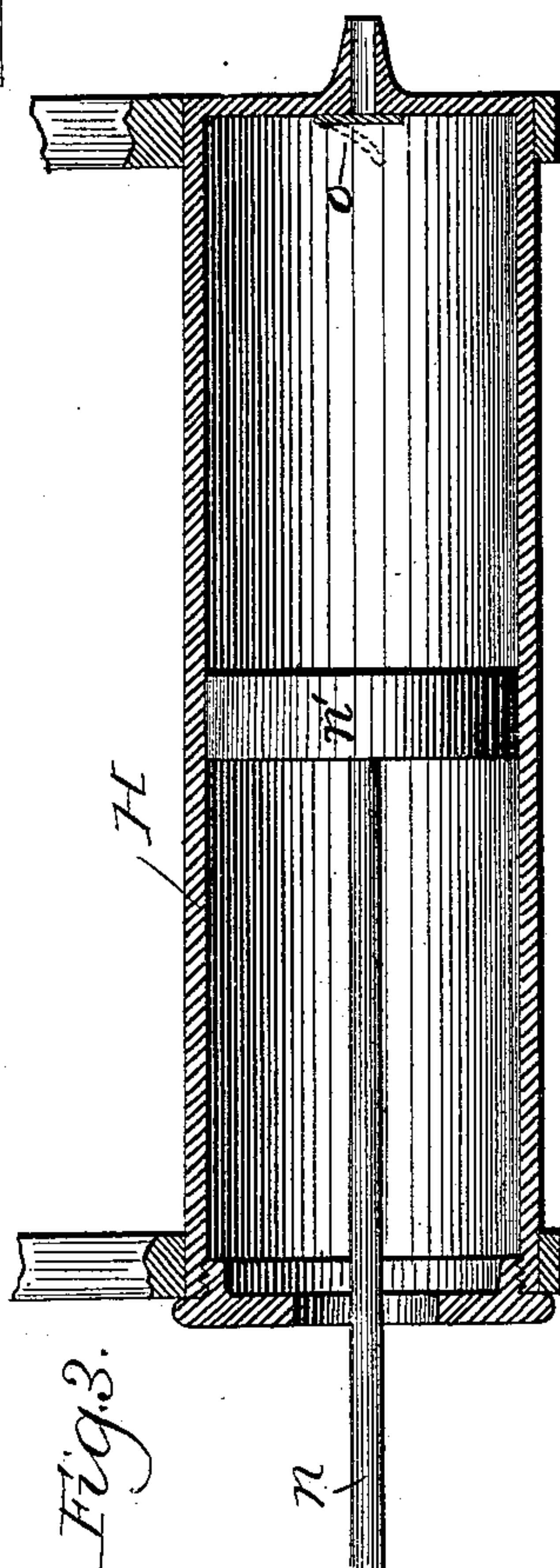


Fig. 3.

Witnesses:

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UNITED STATES PATENT OFFICE.

WILLIAM HANLEY, OF CHICAGO, ILLINOIS.

CAR BRAKE AND STARTER.

SPECIFICATION forming part of Letters Patent No. 309,848, dated December 30, 1884.

Application filed May 28, 1884. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HANLEY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and Improved Combined Starter and Brake for Cars; and I hereby declare the following to be a full, clear, and exact description of the same.

It is the object of my invention to provide cars with means whereby they may be stopped and started after having been stopped by the mere manipulation of a handle; and to this end my invention consists in mechanism attached to the bottom of the car, capable of being operated to bring the car to a standstill when in motion, and actuated through the medium of a spring, or of the combined action of a spring and compressed air to start the car after it shall have been brought to rest.

My invention further consists in certain details of the construction and combinations of the parts of the mechanism above referred to, all as hereinafter fully set forth.

Referring to the drawings, Figure 1 is a plan view of my invention duplicated and applied to the bottom of a street-car; Fig. 2, a sectional view taken on the line 2 2 of Fig. 1, and viewed in the direction of the arrow-heads; and Fig. 3, a sectional view of a detail.

My invention is represented in the drawings in its application to street-cars, in which connection its principal purpose is to cause to be avoided the great strain upon the horses which is incidental to their exertion in overcoming the inertia of a car at rest, thereby greatly to prolong their lives and usefulness, and it is shown as being provided in duplicate for each car, to be operated alternately from each end, depending upon the direction of the car's motion. Where the forward end of a car, however, always remains the same, as is the case with one-horse cars, which are, and with others, which may be, turned around at the ends of their routes upon turn-tables, but one device is required.

A is a rectangular frame, comprising the side bars, *v v*, and cross-bar *v'*. The frame A is supported within bearings *u* upon the bottom of the car, in which bearings it has a longitudinal reciprocating motion.

B B are the axles, secured to the car in the

usual way, and carrying the wheels C, which revolve with them.

D is a shaft located in the rear of an axle, B, and revolving within bearings *t*, provided on the bottom of the car. A rope or chain, *s*, is secured at one end to the rear face of the cross-bars *v'* of the frame A, one toward each end of the same, and at its opposite end to the shaft D, passing under the latter and being secured upon its upper side, as shown at *x*.

E E are pulleys secured upon the shaft D to revolve with it, and E' E' are pulleys smaller than and directly opposite the pulleys E E, each pulley E being connected, by means of a rope or chain, *p*, with the opposite pulley E'. The pulleys E' E' are fixed loosely upon the axle B, and are provided upon their outward ends each with a ratchet-gear or clutch, *r*, to engage with a similar gear upon the end of the hub of each ratchet-wheel F. The ratchet-wheel's F are rigidly secured upon the axle B—one on each side of its center—in line with a side bar, *v*, to the end of each of which side bars is hinged an extension forming a pawl, G, controlled by the spring *q*, and having downward and forward projecting teeth to engage with the teeth of the ratchet-wheel F, projecting in the opposite direction, whereby the revolution of the ratchet-wheels, and consequently of the axle B and wheels C, is either obstructed or started by means and in the manner hereinafter clearly described.

It is not an essential feature of my invention to form the pawl G as an extension of a side bar, *v*, by means of a hinge-joint, and to control its upward movement by means of a spring, *q*, all in the manner shown in the drawings, since the side bars, *v*, could themselves be made sufficiently long, and be provided toward their ends and on their lower sides with the necessary teeth, when their own weight would tend to keep them in the proper position.

H H are air-cylinders properly secured from the under side of the car to lie each within the frame A and parallel with a side bar, *v*, of the frame, and provided each toward its inward extremity with an inwardly-opening check-valve, *o*. (See Fig. 3.) Each cylinder is provided with the usual piston-head, *n'*, at one end of a piston-rod, *n*, the opposite end of

which piston-rod is secured to the cross-bar v' of the frame A to move with the latter. Rods m are secured, each at one end, to the cross-bar v' , and at their opposite ends within bearings l , projecting downward from the bottom of the car, in which bearings they have, like the piston-rods n , a longitudinal reciprocating motion to correspond with that of the frame A. A spiral spring, m' , surrounds each rod m , and is confined between the inner face of the cross-piece v' of the frame and the end of a bearing, l .

The mechanism above described may be operated by the driver from the forward end of the car by means of a brake, K, comprising a handle and vertical rod having a ratchet-wheel toward its lower extremity, and controlled by a dog, all in the form and of the construction of a common street-car brake.

The operation hereinafter described is effected through the medium of levers I I, connected at one end by a chain, i , each with the brake in the manner shown, and crossed and pivoted together, in the manner of scissors, by means of a bolt, y , inserted into the bottom of the car. The levers are bent at their opposite ends, as shown at z , to lie parallel with the edges of the recesses k , formed at the inner ends of the pulley E' .

The operation of my device is accomplished as follows: When the car is in motion, the brake K remains set by winding the chains i upon it, and it is held in such position by means of the dog mechanism above referred to, against the resistance of the springs h , secured to the frame-work of the car, and to which the ends of the levers I are attached, in order to free the clutch mechanism r on the pulleys E' from engagement with the hubs of the ratchet-wheels F and to permit the axle B to revolve independently of the pulleys E' . To stop the car, the brake K is released by disengaging the dog, when the reaction of the springs h causes the ends z of the levers I to force the clutch r upon the pulleys E' into engagement with the ratcheted hubs of the wheels F, thereby causing the pulleys E' to revolve with the axle B and to revolve the shaft D by means of the unwinding of the ropes or chains p , which connect the pulleys E and E' from the pulleys E. With the unwinding of the ropes or chains p the shaft D is revolved, and winds upon itself the ropes or chains s , whereby the frame A is drawn backward against the resistance of the air contained within the cylinders H when air-pressure is employed, and against the resistance of the springs m' upon the rods m , which springs, when used in connection with air-pressure, should be formed about twice the length of the piston-rods n , in order to allow the same to have the full capacity of their movement within the cylinders. The drawing back of the frame A causes the racks or pawls G to engage with the teeth of the ratchet-wheels F, against which they are pressed by the resistance offered by the springs q . The car will thus have been brought to a

standstill upon having run, after the initial releasing of the brake K, about twenty feet, the mechanism being constructed to permit this leeway, which may be increased or diminished, if desired. To start the car again without assistance or with but comparatively slight assistance from the horse or horses, the chains i are wound by the driver upon the brake-lever K sufficiently to release the pulleys E' from engagement with the hubs of the ratchet-wheels F, when the compressed air within the cylinders H, assisted by the reaction of the springs m' , will force the frame A forward, winding the ropes or chains p from the pulleys E upon the pulleys E' and unwinding the ropes or chains s from the shaft D, thus preparing the mechanism for the next operation of stopping the car, and the racks or pawls G will operate to pull the ratchet-wheels F around in the direction of the desired motion of the car, thereby revolving the axle B, and with it the wheels C.

There is nothing to prevent the use of the ordinary brake on cars provided with my mechanism, and nothing to hinder its operation, if provided.

It is quite manifest that the starting operation could be effected by the expansive force of the springs alone and without any assistance from the compressed air within the cylinders H, since the springs can be made sufficiently large and strong for the purpose, and my invention therefore includes this construction.

It is also quite obvious that when air is employed a single air-cylinder placed centrally with respect to the sides of the frame A and of the proper dimensions could be employed to accomplish the work shown and described to be performed by two cylinders; and it is equally obvious that various of the details—viz., the pulleys E E' , ratchet-wheels F, sides v of the frame A, and the various ropes or chains and springs, and the levers I—instead of being provided in duplicate, as shown in the drawings and described, could be arranged, perhaps not so conveniently, but still to operate effectively, if provided singly, and all such modifications are therefore within the spirit of my invention.

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

1. The combination, with an axle of a car, of a spring or springs, H, and mechanism, substantially as described, operating to stop the car when in motion and compress the said spring or springs H, and operated by the expansive force of the said spring or springs automatically to revolve the wheels and start the car when it shall have been brought to rest.

2. The combination, with an axle, B, of a car, of mechanism for starting the said car after it shall have been brought to rest, said mechanism comprising, in combination, a ratchet-wheel, F, a rack, G, engaging with the said ratchet-wheel, a cylinder, H, containing compressed air and provided with a piston

and rod, and a spring, m' , the whole being constructed and arranged to operate substantially as described.

3. The combination, with an axle, B, of a
5 car, of mechanism for stopping the motion of
the car, said mechanism comprising, in combination, the following elements, viz: a ratchet-wheel, F, secured upon an axle, B, a frame,
A, supported upon the bottom of the car, and
10 having a longitudinal reciprocating motion, a rack, G, upon the said frame, a rotary shaft, D, a rope or chain, s, connecting the said
frame with the said shaft, a pulley, E, secured
upon the shaft D, a pulley, E', secured loosely
15 upon the axle B, a rope or chain, p, connecting
the pulley E with the pulley E', and means,
substantially as described, for causing the
pulley E' to revolve with the axle B, the whole
20 being constructed and arranged to operate as
and for the purpose set forth.

4. The combination, with an axle, B, of a
car, of mechanism for bringing the car to a
standstill when in motion, and mechanism for
starting the car when it shall have been brought
25 to a standstill, the said mechanisms comprising, in combination, the following elements,

viz: a ratchet-wheel, F, secured upon the axle
B to revolve with it, a frame, A, supported
within bearings u upon the bottom of the car,
and having a longitudinal reciprocating move- 30
ment, a rack, G, upon the frame A, a rotary
shaft, D, a rope or chain, s, connecting the
frame A and shaft D, a pulley, E, rigidly se-
cured upon the shaft D, a pulley, E', loosely
secured upon the axle B, a rope or chain, p, 35
connecting the pulleys E and E', clutch mechanism r upon the pulley E to coincide with
similar mechanism formed upon the wheel F,
a lever, I, operated by the brake K to place the
pulley E' in and out of gear with the wheel F, 40
an air-cylinder, H, containing a piston-head,
 n' , and valve o , and having its piston-rod n
secured to the frame A, a rod, m , secured at
one end to the frame A, and sliding at its opposite
end within a bearing, l , and a spring, 45
 m' , upon the rod m , the whole being constructed
and arranged to operate substantially as
described.

WILLIAM HANLEY.

In presence of—

HENRY C. STRONG,
C. C. LINTHICUM.