

CHARLES A. HASKINS.

Improvement in Pneumatic-Brake and Car-Starter.

No. 127,164.

Patented May 28, 1872.

Fig. 1

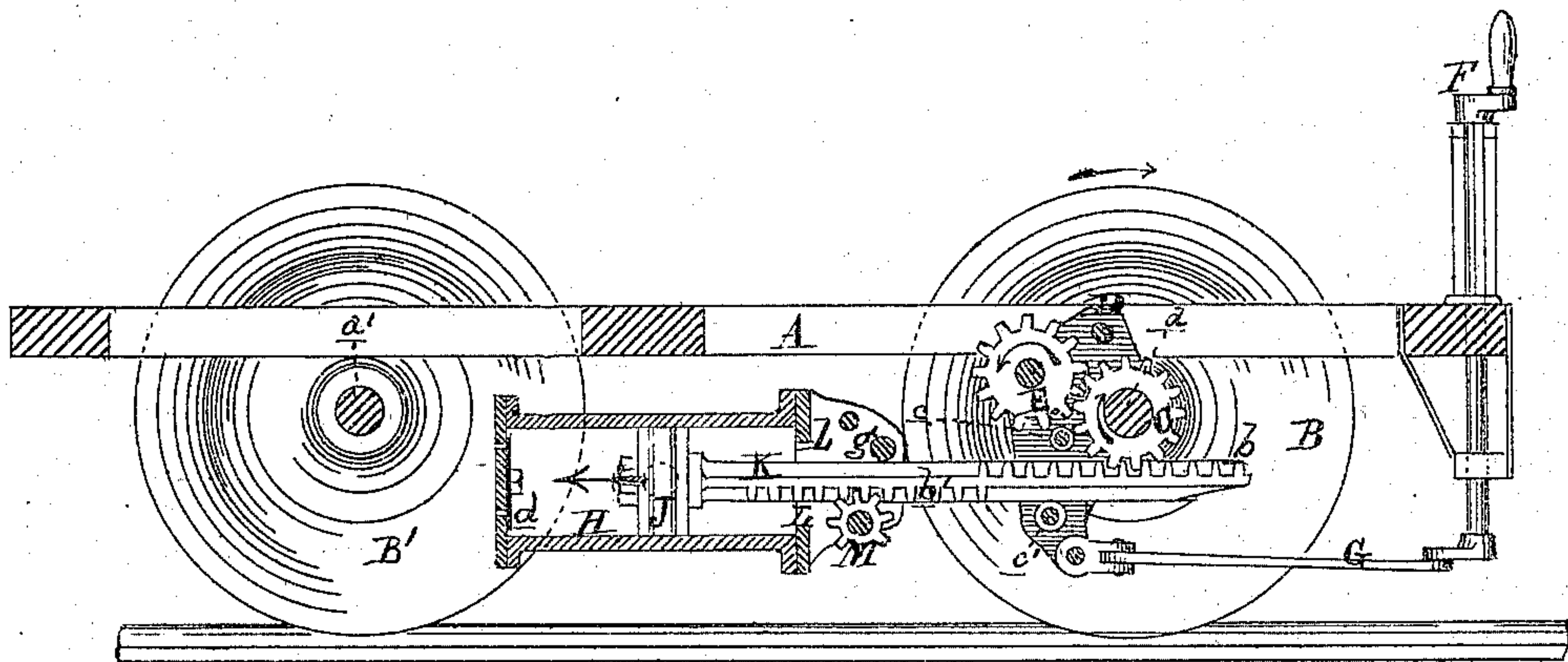
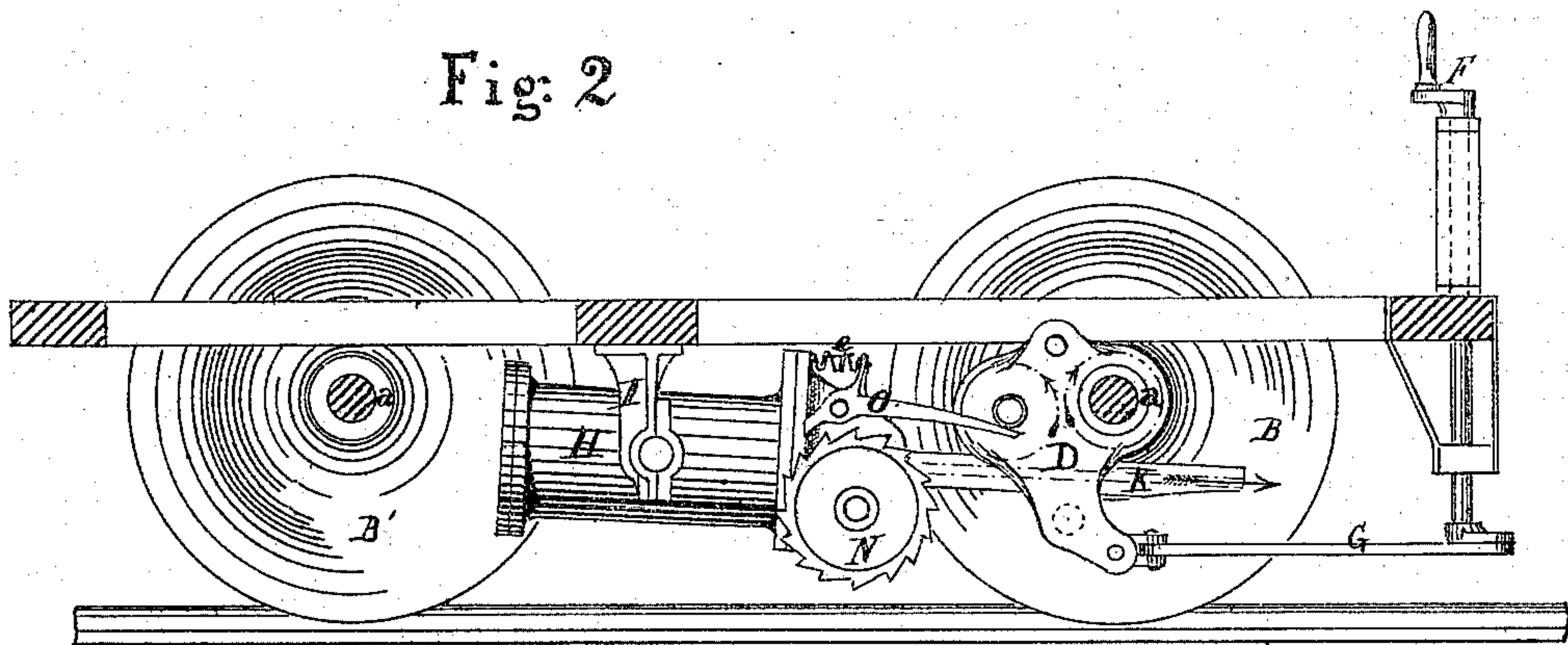


Fig. 2



Witnesses:

Inventor:

Wm H. Lotz
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UNITED STATES PATENT OFFICE.

CHARLES A. HASKINS, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-THIRD OF HIS RIGHT TO ELIJAH SMITH, OF SAME PLACE.

IMPROVEMENT IN PNEUMATIC BRAKES AND CAR-STARTERS.

Specification forming part of Letters Patent No. 127,164, dated May 28, 1872.

To whom it may concern:

Be it known that I, CHARLES A. HASKINS, of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Combined Pneumatic Brake and Car-Starter; and I do declare that the following is a true and accurate description thereof, reference being had to the accompanying drawing and to the letters of reference marked thereon and being a part of this specification, in which—

Figure 1 is a sectional elevation of the lower parts of a horse-car fitted with my improvement. Fig. 2 is a side elevation of the same, the parts being shown in position, as when impelling the car forward in starting.

Like letters refer to like parts in each figure.

The nature of this invention relates to an apparatus for arresting the motion of a horse-car by the compression of air in a pneumatic cylinder under a car-bed, through peculiar mechanism operated by the axle of the front pair of wheels, and so arranged that the air compressed in the cylinder, in arresting the motion of the car, can be made available at will of the driver for starting the car again, thereby relieving the animal or team which draws the car from the most severe labor attendant upon the movement of the car. The invention consists in the peculiar mechanism employed for compressing the air in arresting the movement of the car, and in connection therewith the devices for directing the application of the power so stored up to overcoming the *vis inertiae* of the car in starting again, as more fully hereinafter set forth.

In the drawing, A represents the bed-frame of an ordinary horse-car, and B B' the front and rear wheels mounted on axles *a a'*, respectively, journaled in their boxes in the usual manner. C is a small spur-gear keyed fast to the center of the front axle. D is an open frame, or, if preferable, a pair of plates of the form shown, embracing at the upper part the said spur-gear, and turns loosely on the said axle, which passes through it. E is a pinion of the same diameter as the gear C, and revolves loosely upon a shaft transversely secured in said frame D at the rear upper corner thereof, and meshes with said gear. The

said frame D, vibrating on the front axle, is moved by a vertical shaft, F, passing up through the front platform in front of the driver, and is provided with a crank at each end, the lower one being attached to the lower end of the vibrating frame D by a connecting-rod, G; or, in lieu thereof, a reversing-lever may be employed, by which the driver can vibrate the said frame. H is an oscillating pneumatic cylinder, open at its front end, its trunnions being journaled in brackets or hangers I pendent from the bottom of the car, in line with the gears C E. J is a piston accurately fitted in said cylinder, and provided with a rod or bar, K, carrying a toothed rack, *b*, at the upper side of the outer part thereof, and a similar rack, *b'*, on the under side, extending rearward from the first rack. This rack passes between two rollers, *c c'*, transversely journaled in the frame D, one above and the other below the said rack-bar K. The cylinder is provided with air-openings in its rear head, over which is fitted a common rubber or other valve, *d*, which may open in the forward movement of the piston to admit air, thus preventing a partial vacuum in a quick forward movement of the piston, and, of course, closing when the said piston is forced back. The arrangement of the crank-shaft F, and its connection with the vibrating frame and the rack-bar is such that the said frame can be so adjusted as to lower the rack-bar out of gear with the spur-wheel C, in which case the gears C E revolve idly. By a quarter turn of the crank, however, the lower end of the vibrating frame is thrown back, which raises the said rack-bar until rack *b* meshes with the gear C, as shown in Fig. 1, the cylinder rotating on its trunnions to allow this movement. It is evident, now, that in the forward movement of the car the rack-bar and piston will be forced back into the cylinder, the car-wheels, gears, and rack-bar moving in the directions indicated by the arrows in Fig. 1, whereby the air contained within the cylinder will be compressed until finally its resistance to such compression will overcome the momentum of the car and bring it to a stand-still in a quick, easy, and steady manner. To retain the pressure so developed in the cylinder, making it serve as a brake to the car, and to utilize it in overcom-

ing the *vis inertiae* when ready to start again, is the principal object of my invention, which I accomplish in the following manner:

To the front head of the cylinder I bolt an open frame in the form of a pair of vertical webs, L, in the lower part of which there is journaled a pinion, M, which meshes with the rack *b'*. On the shaft which carries the said pinion, outside the frame L, through which one end of the said shaft projects, I rigidly secure thereto the ratchet N. With this ratchet engages a pawl, O, being kept in engagement therewith by a spiral spring, *e*, connecting a stud thereon with the head of the cylinder. The pawl is provided with a long arm, which projects under a stud, *f*, at the side of the rear upper corner of the vibrating frame D, so that when the rack-bar is forced into the cylinder by the action of the gear C the pawl will hold it there, the said rack-bar being kept in engagement with the pinion M by a transverse roller, *g*, journaled in the frame L above it.

To start the car, the driver gives the cranked shaft F a quarter turn, which carries the lower end of the frame D forward, bringing down the pinion E into gear with the rack *b*, and the stud *f* into contact with the arm of the pawl O, withdrawing its dog from the ratchet, as seen in Fig. 2, when the compressed air will impel the piston and rack-bar forward, as shown by the arrow in Fig. 2, exerting the power of the compressed air to rotate the axle in a forward direction, the rack *b* conveying to said axle such forward motion through the pinion E, then intermediately in gear with it and the spur-wheel C on said axle until the said rack *b* has passed on out of gear with said pinion E, giving the animal or team only the labor of

moving the car after it has been put in motion. All the gears should be shrouded, to insure the accurate movement of the rack-bar, and the pendent hangers may be braced from sleeves on either axle, or from the bed of the car, if found necessary.

Although I deem compressed air the most desirable means for accomplishing these results, I may, under certain conditions find it necessary to supplement it with a spring or springs in the cylinder, or to rely upon such springs entirely to produce these results; but in all cases with substantially the mechanism herein described and shown.

It is obvious that my apparatus can only be employed for the purposes in one direction, making it necessary to turn the car around at the end of each trip.

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

1. The hangers I, oscillating cylinder H, pinion J, rack-bar K, frame L, pinion M, roller *g*, ratchet N, pawl O and spring *e*, in connection with the spur-gear C secured to one of the axles of the car, and operated through the vibrating frame D, sleeved on said axle, for arresting the movement of the car by the compression of air in said cylinder, substantially as described and shown.

2. In connection with the foregoing parts, the intermediate gear E, stud *f*, and connecting-rod G and crank-shaft F, substantially as and for the purpose set forth.

CHARLES A. HASKINS.

Witnesses:

WM. H. LOTZ,
JULIUS WELCK.