

L. B. KENDALL.
Car-Brakes.

No. 149,226.

Patented March 31, 1874.

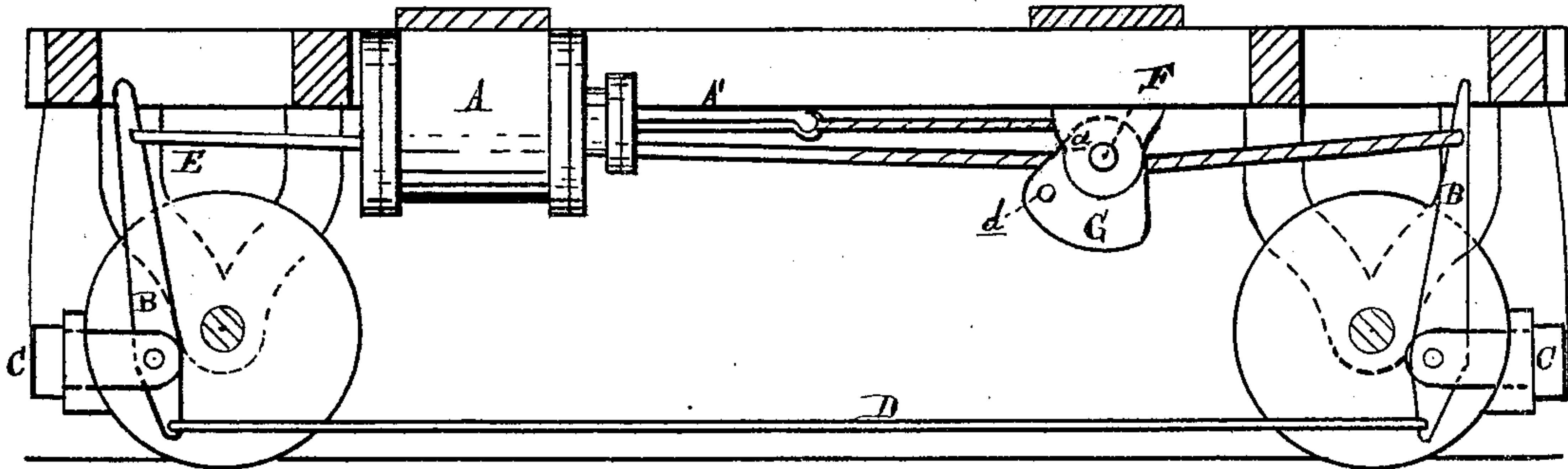


Fig. 1.

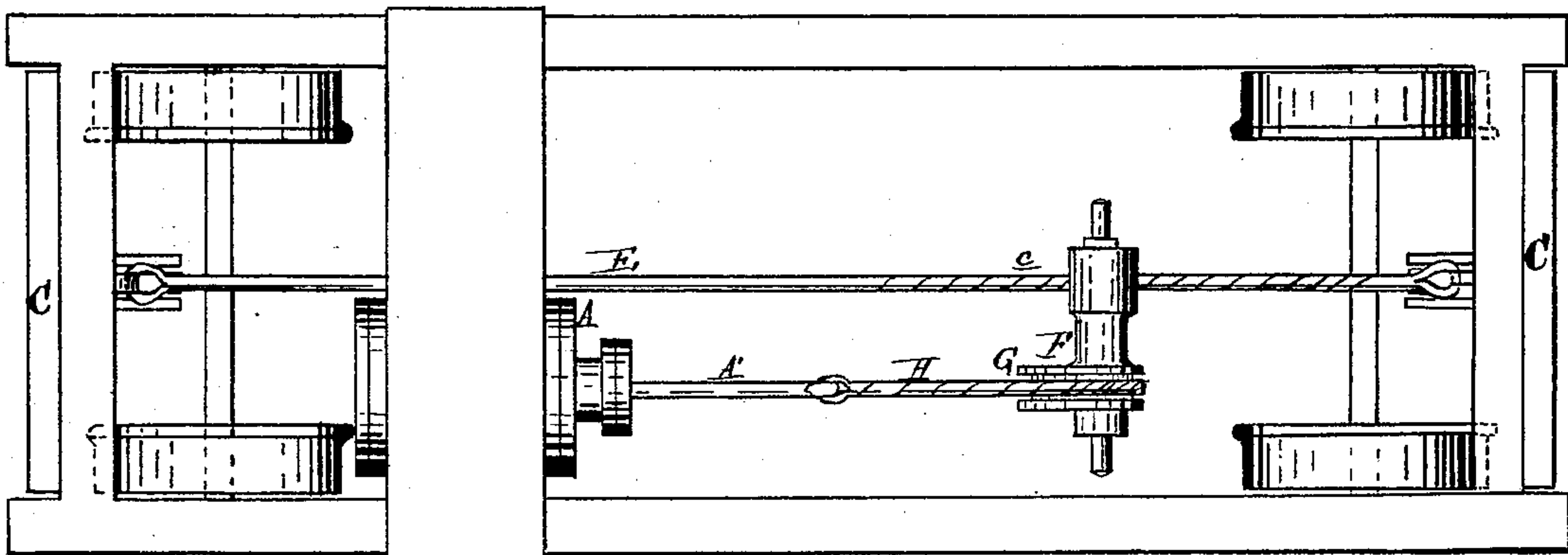


Fig. 2.

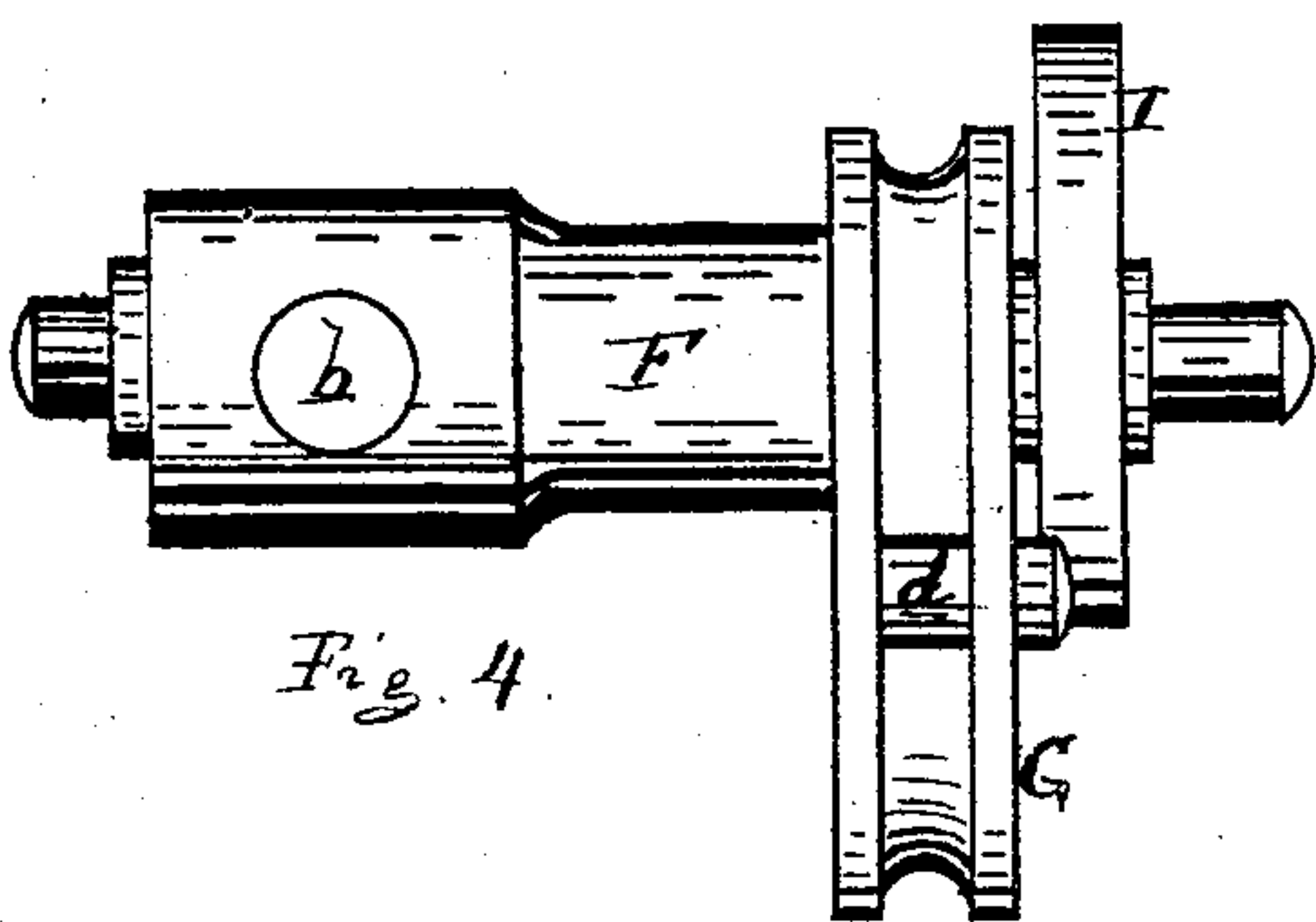


Fig. 4.

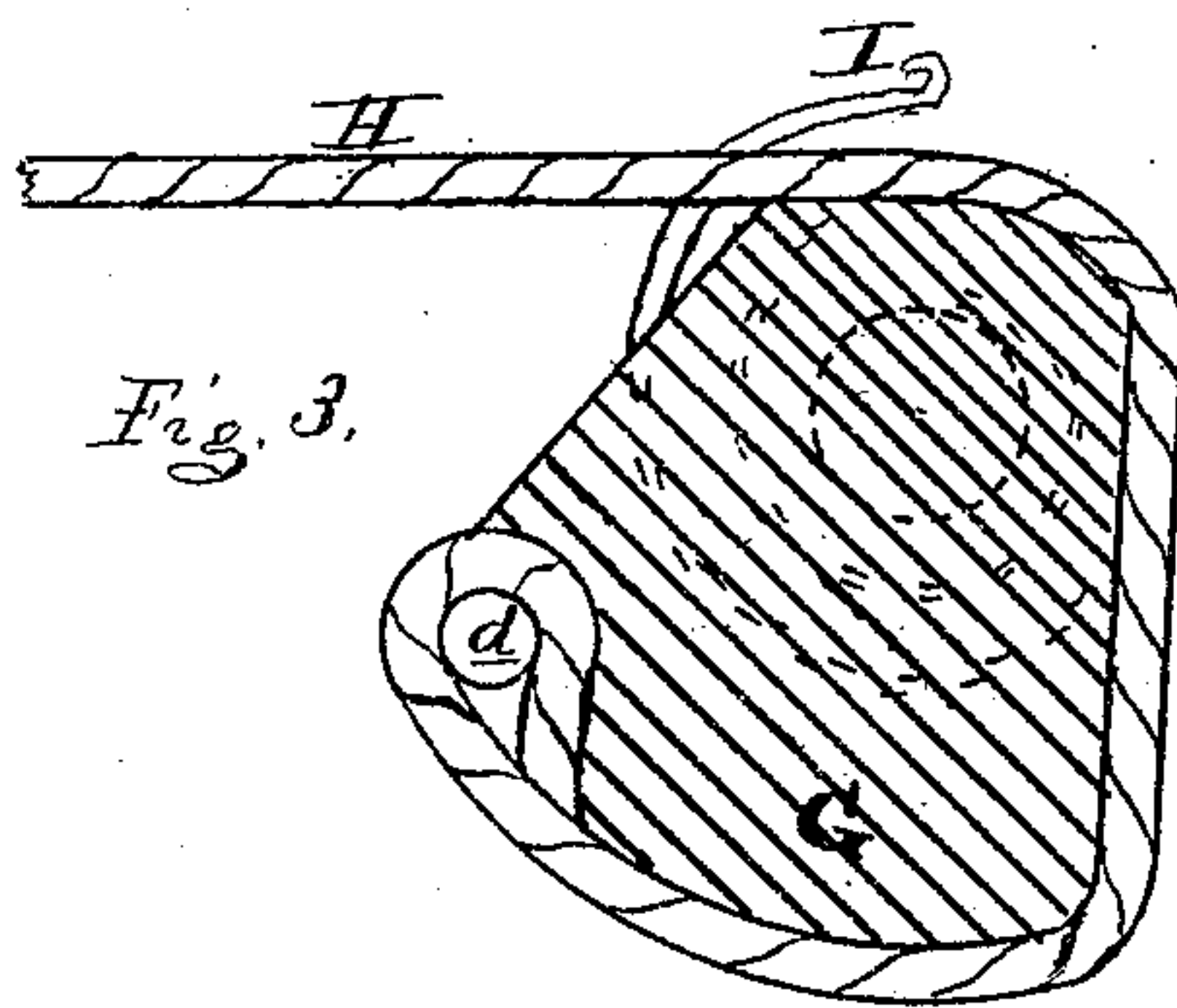


Fig. 3.

ATTEST.
Wm. P. Shallding
C. E. D. Quistis

INVENTOR.
L. B. Kendall.
By Attorney.
Thos. S. Sprague.

UNITED STATES PATENT OFFICE.

LUCIUS B. KENDALL, OF KALAMAZOO, MICHIGAN.

IMPROVEMENT IN CAR-BRAKES.

Specification forming part of Letters Patent No. **149,226**, dated March 31, 1874; application filed February 16, 1874.

To all whom it may concern:

Be it known that I, LUCIUS B. KENDALL, of Kalamazoo, in the county of Kalamazoo and State of Michigan, have invented certain Improvements in Power Car-Brakes, of which the following is a specification:

The nature of this invention relates to certain improvements in that class of car-brakes wherein steam or compressed air is employed for setting the brakes; and its objects are, first, to take up the slack of the several brake-connections and engage the brake shoes with the wheels as speedily as possible, and with the least expenditure of power; secondly, after engaging the brake-shoes, to press them against the wheel-treads with great force; third, to so apply the power as to set the brakes with equal force during the wearing down of the brake-shoes; fourth, to release the brakes quickly and disengage the shoes from the wheels; and fifth, to so arrange the power connections as to not interfere with the free use of the hand-brakes.

Figure 1 is a partial sectional side elevation of a car, only the wheels and axle nearest each end being shown, the trucks and intermediate axles being omitted, the better to show the operation and application of my improvement. Fig. 2 is a plan of the same. Fig. 3 is an enlarged longitudinal vertical section of the sector-sheave, showing, also, partially in dotted lines, the release-spring. Fig. 4 is an enlarged face-elevation of the sheave and shaft.

In the drawing, A represents the cylinder, and A' the piston-rod heretofore used for setting the brakes of a car by the action of compressed air upon the front side of the piston. B B are the brake-levers at the extreme ends of the trucks, (which are not shown,) pivoted between clips at the middle of the inner faces of the brake-beams C C. D is the rod which connects the lower ends of the levers C, and E the rods or chains at their upper ends, which are actuated through the ordinary hand-setting apparatus, (not shown,) which I do not in any way change or disturb. Across the car-bed I journal a shaft, F, in pendent hangers *a*. Through this shaft or winch I make a hole, *b*, through which I pass a cord or chain, *c*, which forms part of the rod E. On the shaft F is secured a sector-shaped cam, G, grooved at its periphery, to one corner of which is secured

the end of a rope or chain, H, by a pin, *d*, the cord passing around, over the cam, to the end of the piston-rod A', to which it is secured. When no strain is on the chain H the cam hangs in the position shown in Figs. 1 and 3, the brake-chain E having free play through the hole in the shaft.

It is evident that, as compressed air is admitted to the cylinder to force in the piston and draw the chain H, the result will be that the shaft F will be revolved, rapidly at first, with the expense of little power and short travel of piston, as the chain pulls over the small arc of the cam and subsequently exerts an increased force as the partial revolution of the cam will cause it to pull over the larger arc, which, being firmly secured to the shaft F, revolves with the cam and winds upon it the brake-lever chain *c*, whereby the brake-shoes are pressed with great force upon the treads of the wheels.

As the air-piston begins to travel a very short movement will take up the slack in the several brake-connections and engage the brake-shoes with the car-wheels, and, as the piston continues to move, it pulls upon the chain H with an increasing ratio of force proportionate to the difference between the leverage of the cam at the commencement of the application of the brakes and that obtained by a partial revolution of the cam, so that if the eccentricity of the cam be two to one, a given pressure upon the piston will exert a double power upon the brakes when fully set.

It will be observed that if the brakes are first set with the full power, when the chain first commences to pull over the large arc of the cam, they will still be set with the full power as the brake-shoes wear away, the chain *c* will then pull a little further around the larger arc. In this manner a steady and uniform pressure upon the wheels is maintained, with double or any other desirably-increased power.

When the pressure is let off from the cylinder A the cam G will, of its own weight, fall back to the position shown in Figs. 1 and 3, unwinding the chain *c* and releasing the shoes from the wheels, but, in order to make such release more certain and effectual, I secure one end of a flat coiled spring, I, to the shaft and the other to the bed of the car, or to one of the hangers *a*, in such a manner that when the

shaft is rotated to set the brakes it will wind up the spring, and when the pressure is off the recoil of the spring will reverse the movement of the shaft and carry back the cam to its proper position.

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

1. The sector-cam G, connected with the piston-rod A' by the chain H and mounted upon the shaft F, having the hole *b* for the passage of the brake-lever chain E, all combined substantially as shown and set forth.

2. The combination with the cam-shaft F of the spring I, as and for the purpose set forth.

3. In combination, the sector-cam G, the chain H, the chain *c*, and the shaft F, all constructed substantially as and for the purpose described and shown.

LUCIUS B. KENDALL.

Witnesses:

H. S. SPRAGUE,
WM. P. SPALDING.