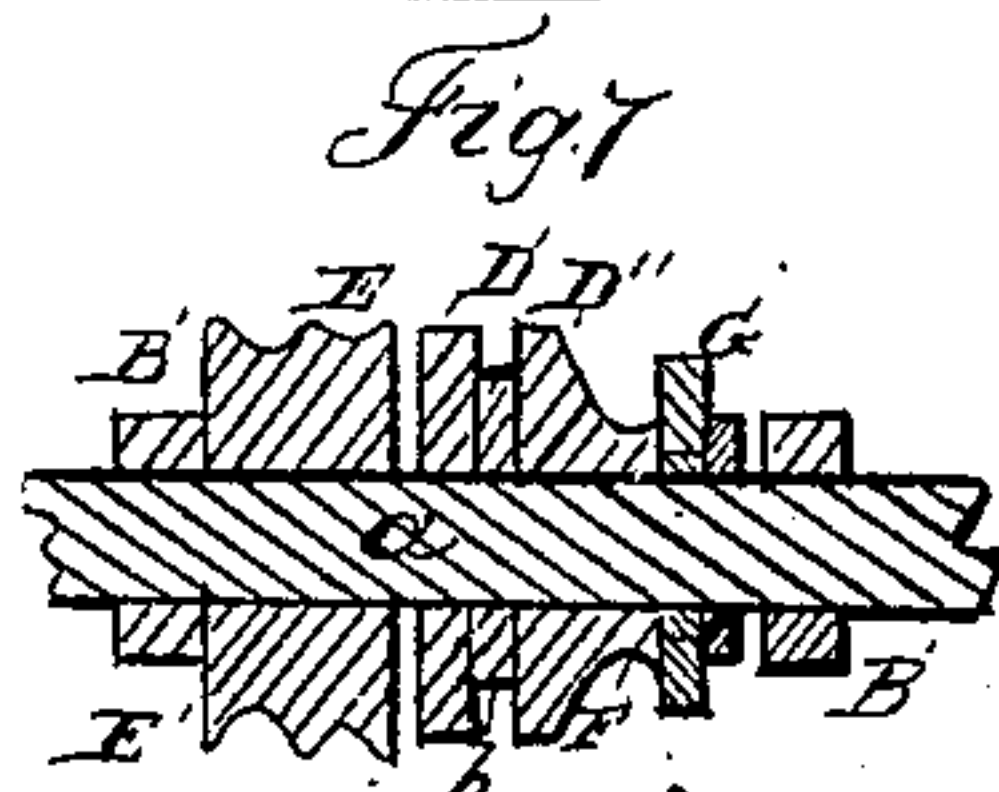
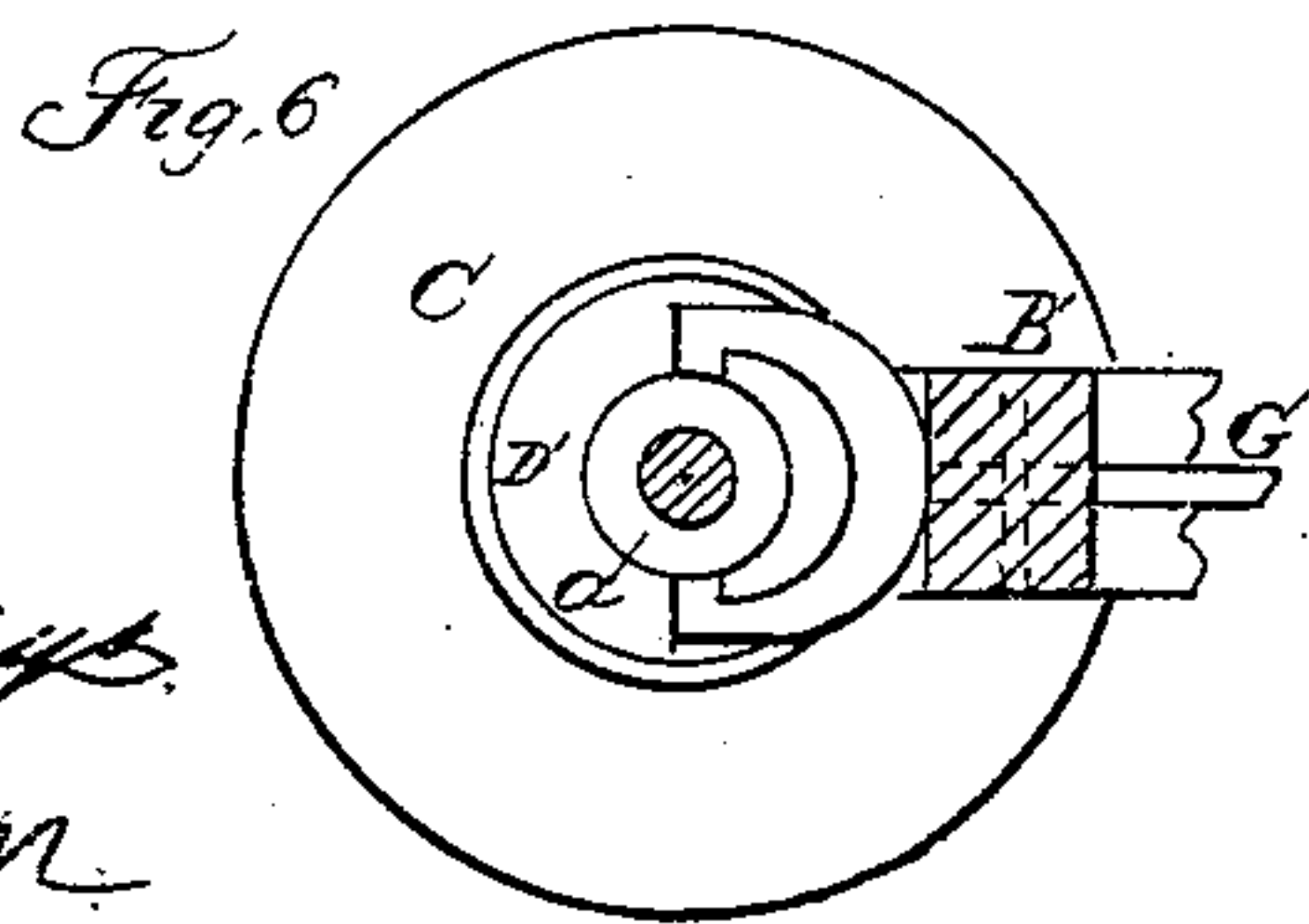
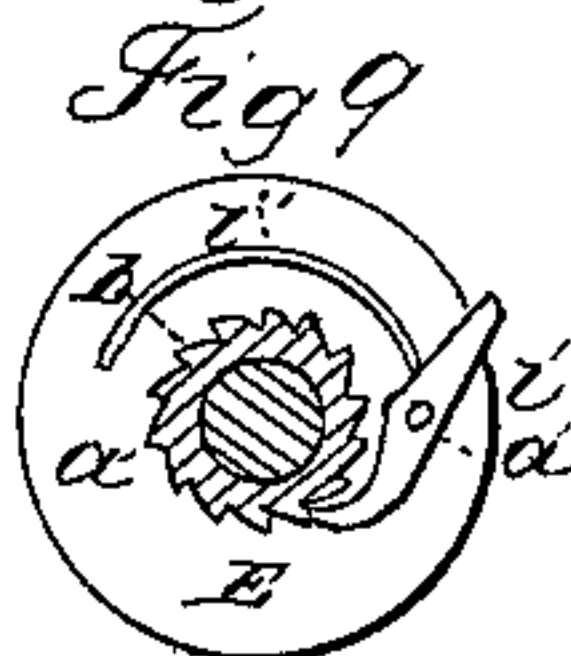
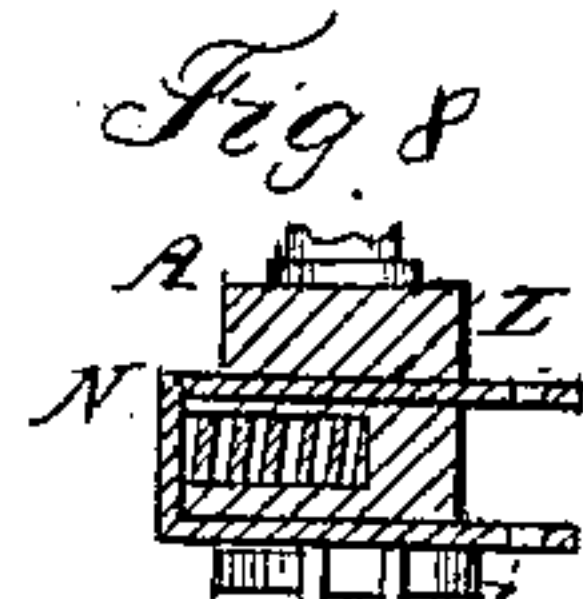
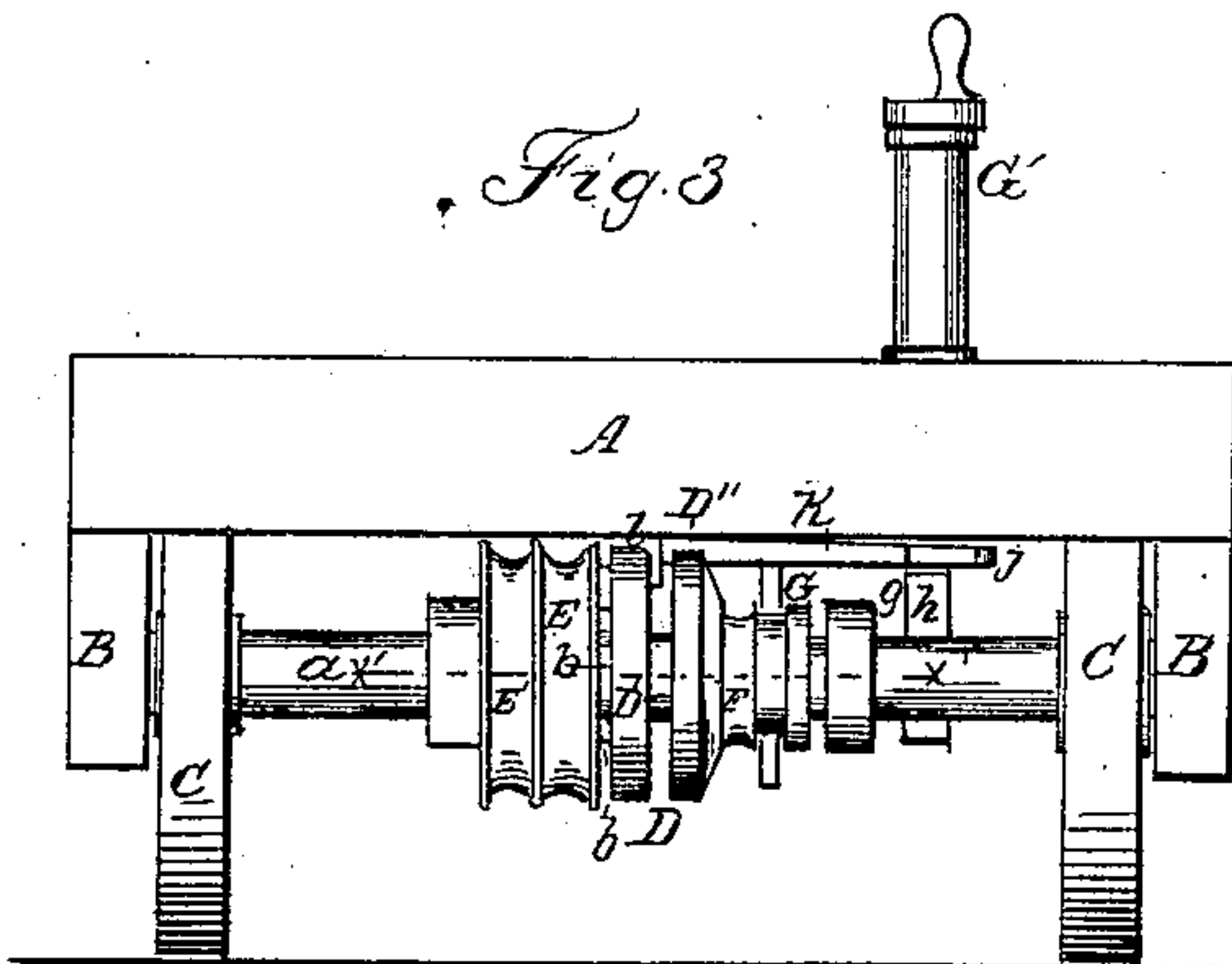
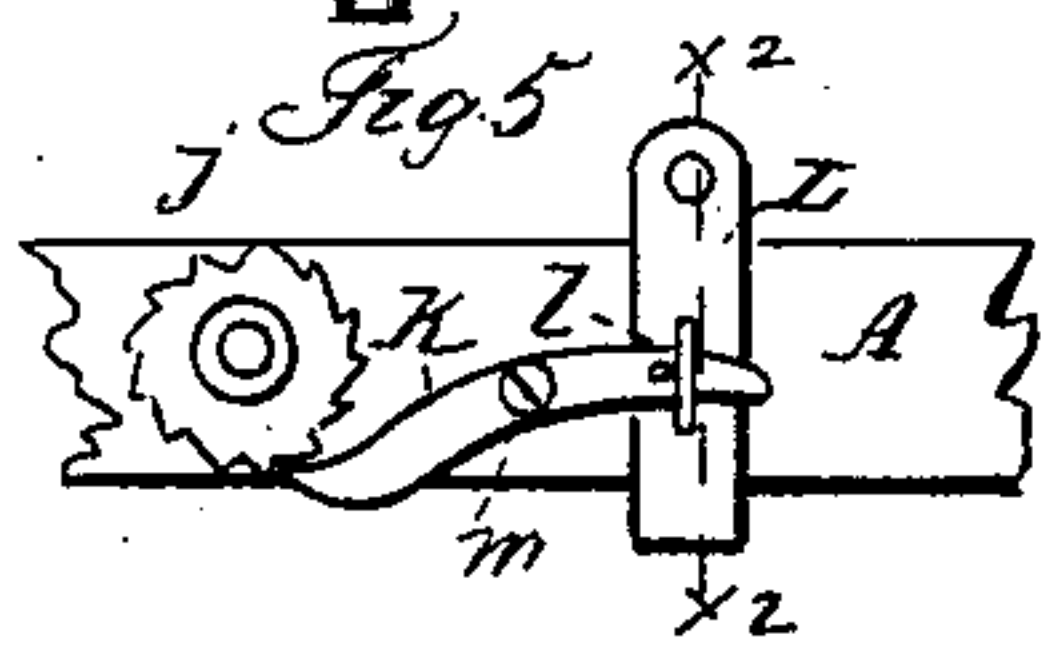
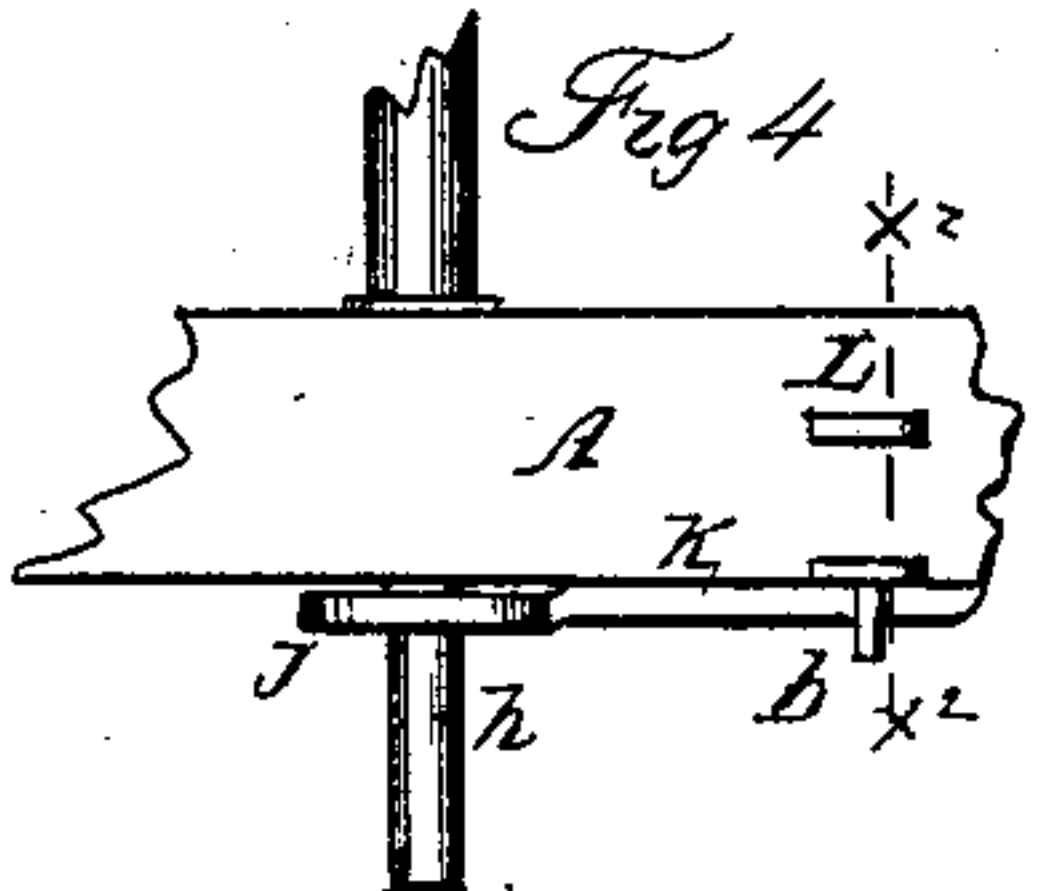
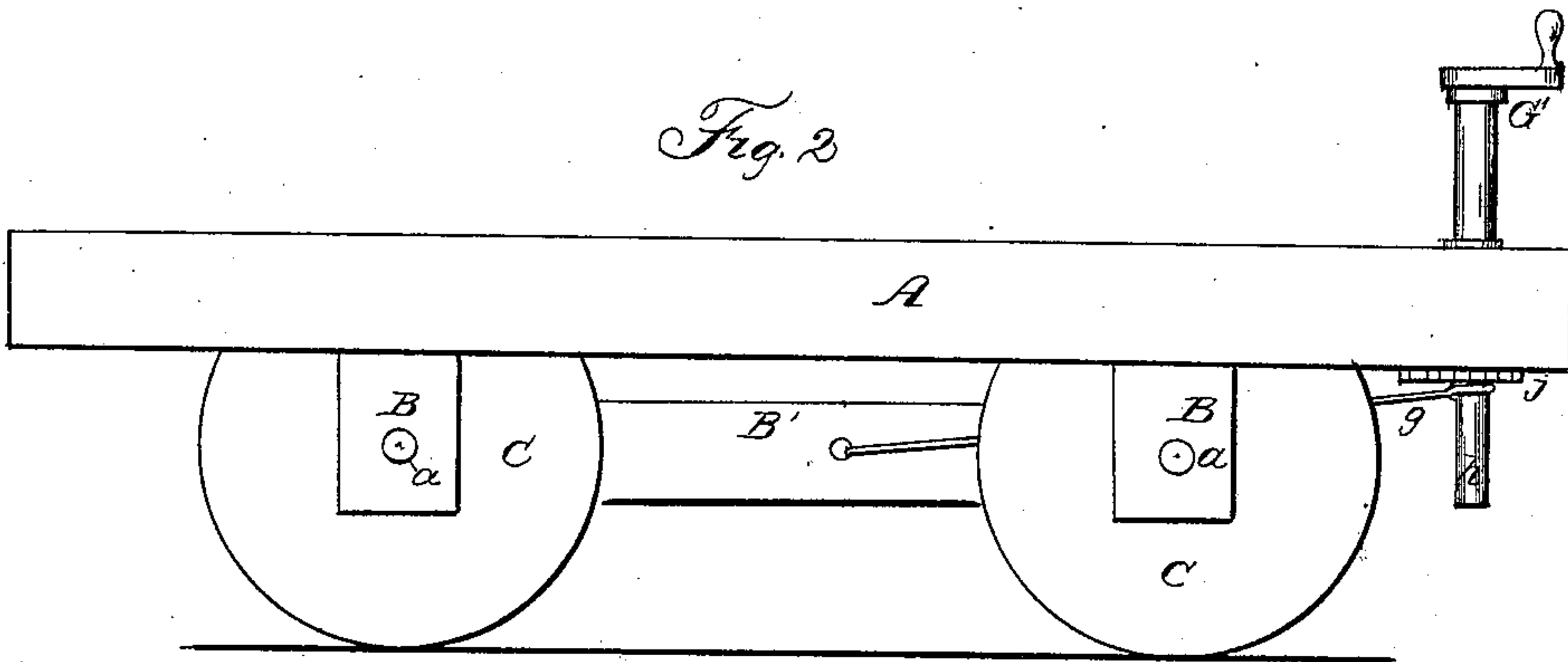
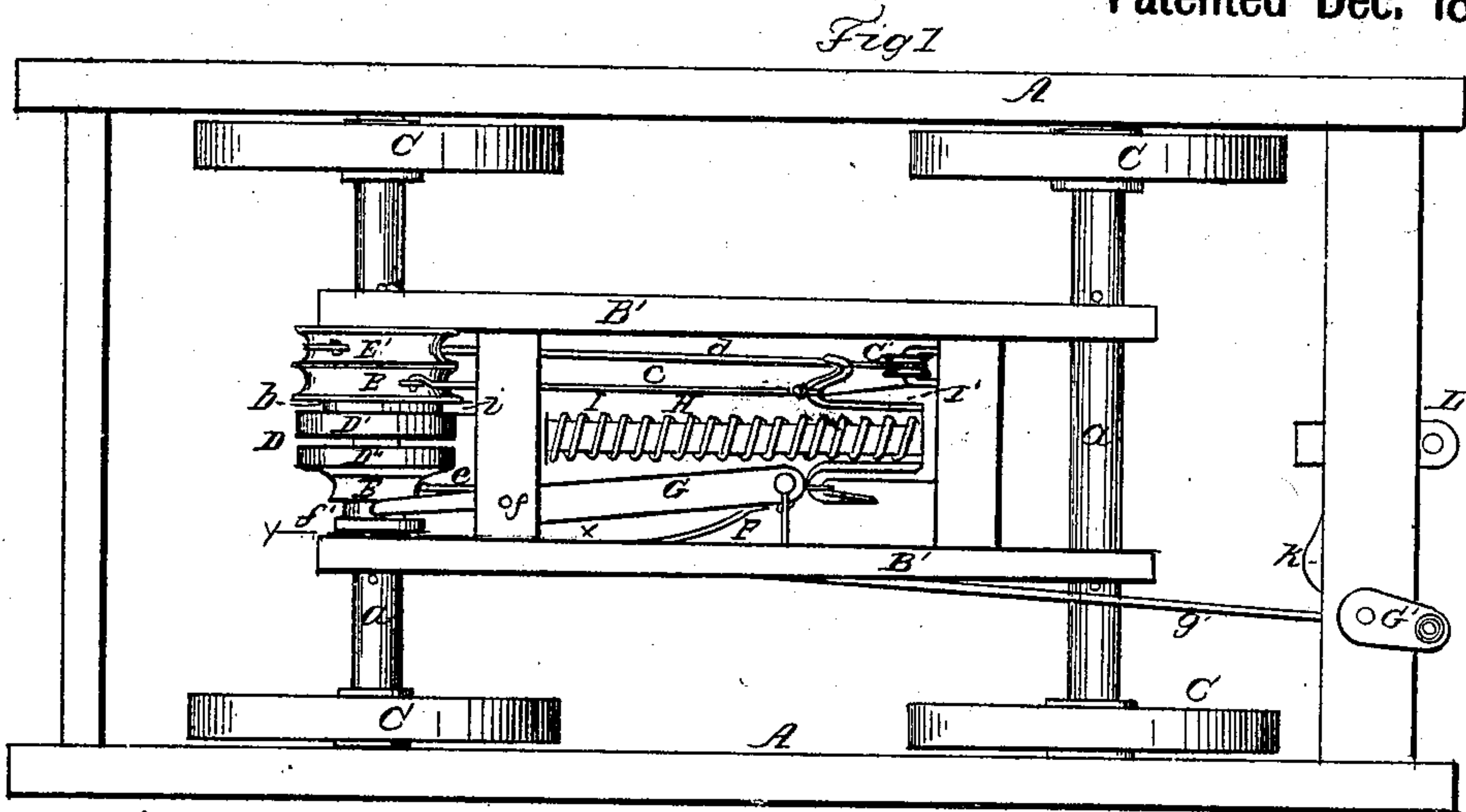


A. HIGLEY.

Car Starter.

No. 60,515.

Patented Dec. 18, 1866.



Witnesses
W H Brundage
Frank Alden

Inventor
Aaron Higley

United States Patent Office.

IMPROVED CAR BRAKE.

A. HIGLEY, OF SOUTH BEND, INDIANA.

Letters Patent No. 60,515, dated December 18, 1866.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, A. HIGLEY, of South Bend, in the county of St. Joseph, and State of Indiana, have invented certain new and useful improvements in Railroad Car Brakes, being an improvement on a patent granted to me August 14, 1866; and I do hereby declare that the following is a full and complete description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a top view.

Figure 2 is a side view.

Figure 3 is an end view.

Figures 4, 5, 6, 7, 8, and 9 are detached sections that will be referred to in the description.

Like letters of reference refer to like parts in the several views.

In the drawings, A represents the frame to which are connected the pedestals, B, figs. 2 and 3. C represents the wheels, the axles, *a*, of which have their bearings in the pedestals B. Connected to the axles, *a*, of the wheels is a framework, B', to which and said axle is attached the apparatus for braking the car. D is a friction coupling on the axle *a*, which coupling consists of two parts, D' D'', to the part D' of which is fastened the ratchet, *b*, which together are secured permanently to and turn with the axle *a*. Between the ratchet-wheel *b*, and the side of the frame B', is secured the double pulley, consisting of the pulleys E E', combined, on the pulley E of which winds the chain or cord, *c*, the other end being connected to the swivel, I', fig. 1; the chain, *d*, being connected to the pulley E', passing from this to the small pulley, C', at the other end of the frame B', over which pulley it passes, and is fastened to the end of the swivel I', which will be referred to hereafter. F is a pulley forming part of the section D'' of the coupling, which takes up the chain, *c*, this being connected to the opposite end of the swivel I' from where the chain *c* is attached. G is a lever pivoted to the frame at *f*, the end of said lever forming a clutch, as shown in fig. 6, which is a view in the direction of the line *x x*, fig. 1, the clutch catching round the groove, *f'*, in the part D'' of the coupling. Fig. 7 is a vertical section in the direction of the line *x¹ x¹*, fig. 3, showing the coupling and pulleys referred to above. Fastened to the end of the lever, G, is a rope, *g*, which passes from the lever through the side of the frame B', along to the shaft, *h*, of the windlass, G', which is used for the purpose of stopping the car. H is a bar extending from one end to the other of the frame B', and rests in the same. Around this bar is coiled the spring, I, at one end of which, on the bar, is the swivel I', referred to above, to the ends of which, as stated, are connected the chains *c*, *d*, and *e*, which are taken up on the pulleys. *i* is a pawl, which is pivoted, at *a'*, to the pulley E, and catching into the ratchet-wheel *b*, which is secured to the section D' of the coupling, the pawl being operated by means of the spring, *i'*, shown in fig. 9, being a view of the pulley E, ratchet *b*, and pawl *i*. Fig. 4 is a portion of the end of the frame, A, showing the shaft of the windlass, G', which extends through the frame, a ratchet-wheel, *j*, being on the under side, in the teeth of which catches the pawl, *k*, which is pivoted at *m*, to the frame, extends back, the end passing through a staple, *l*, which is firmly secured to the under side of the stirrup, L, as shown in fig. 5, which is an under side view of fig. 4, the stirrup being of a rectangular form, as shown in fig. 8, which is a cross-section of the same, in the direction of the line *x² x²*, figs. 4 and 5. N is a spring in the end of the frame, which presses against the stirrup L. As this stirrup is pulled and held forward by the team when the car is in motion, thus contracting the spring N, as soon as the car stops the spring will force the stirrup back in position, and when the stirrup is thus forced back the pawl will catch in the ratchet *j*, which prevents the windlass from turning, and also reserves the force for starting the car, as the pawl will be detached, as hereafter stated, when the car starts, and the braking of the car released, thus preventing the necessity of removing the pawl by the brakeman. As the car starts, the end of the stirrup being connected to the team, it will be allowed to pull forward, thus contracting the spring N, in the opening in the frame, and the end of the pawl passing through the staple, which is secured to the under side of the stirrup, will be pulled with it, thus detaching the opposite end from the teeth of the ratchet-wheel *j*. When it is desired to stop the car, the windlass G' is turned, winding the chain *g* around the shaft of said windlass. The chain being attached to the end of the lever, when it is taken up draws the lever towards the frame, the end of said lever clutching round the groove of the coupling, as stated, moving the part D'' against the part D', and these pressing firmly together, create so much friction that when the wheels are turning the part D'' and pulley F of said part turns with them, when, if the part D'' was not held firmly against the part D', it would remain loose,

not turning at all. When the wheels are in motion, and the part D'' turns with them, the chain *e* is taken up on the pulley F, and the chain *c*, connected to the other side of the swivel, is taken up by the pulley E, thus unwinding the chain *d* from the pulley E', which, passing over the pulley C', is taken up by the swivel, which is drawn towards the coupling as the chains are taken up on the pulleys as stated, thus contracting the spring I on the bar H. When the spring I is contracted by means of the swivel, as described, the chain *d*, as stated, is unwound, and the end being secured to the pulley E', causes the double pulley to turn in the opposite direction from the wheels; the chain *c* will be taken up on the pulley E, as stated, the end of the pawl *i* catching in the ratchet *b*, by the action of the spring *i'*, referred to above, thus preventing the windlass from turning till the pawl is removed. In this way the wheels are stopped, and not allowed to turn in the least, a portion of the force expended in stopping the car being held in reserve to aid in restarting the same. When the car starts, the stirrup, which is pulled forward, contracting the spring, as stated, removes the pawl from the ratchet *j*, which allows the spring *p* to force the lever G back into position. At the same time the reacting force of the spring I moves the swivel back to its proper position, unwinding the chains *c e*, which are taken back with the swivel, and thus turning the pulleys on the axle; and the pawl being pivoted to the pulley E, and catching in the ratchet *b*, aids in turning the wheels at the same time the pulleys turn; thus the car can be started very easily and without much trouble, or stopped, as desired.

This improvement can be applied to either steam or horse cars, and may be attached to one or both axles, so as to be operated from either end of the car.

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

1. The stirrup L and spring N, in combination with the pawl *k* and ratchet *j*, arranged and operating as and for the purpose set forth.
2. The lever G and friction coupling D, in two sections, as set forth, in combination with the pawl *i*, ratchet *b*, and pulleys E E', as and for the purpose described.
3. The swivel I', bar H, spring I, and chains *c d e*, in combination with the pulleys F, E, and E', arranged and operating as and for the purpose described.

AARON HIGLEY.

Witnesses:

JACOB HARDMAN,
HEZEKIAH BIDDLE.