

E. J. ROBERTS.  
Car-Brake.

No. 160,717.

Patented March 9, 1875.

FIG. 1.

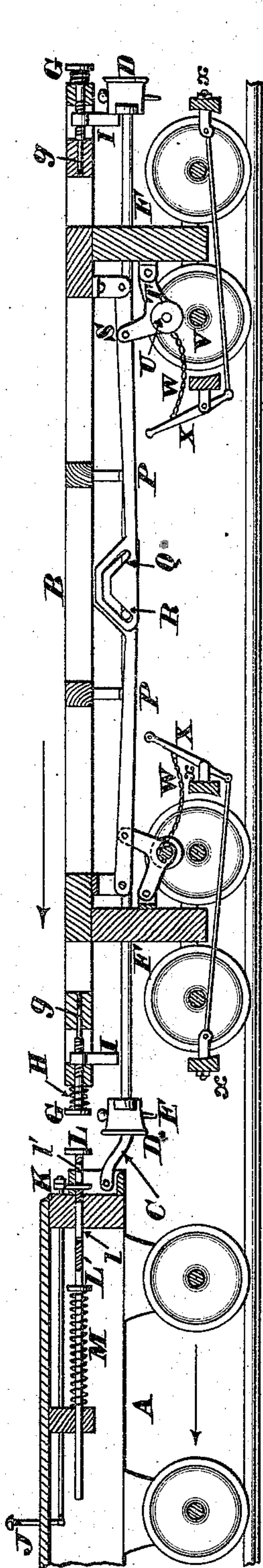


FIG. 2.

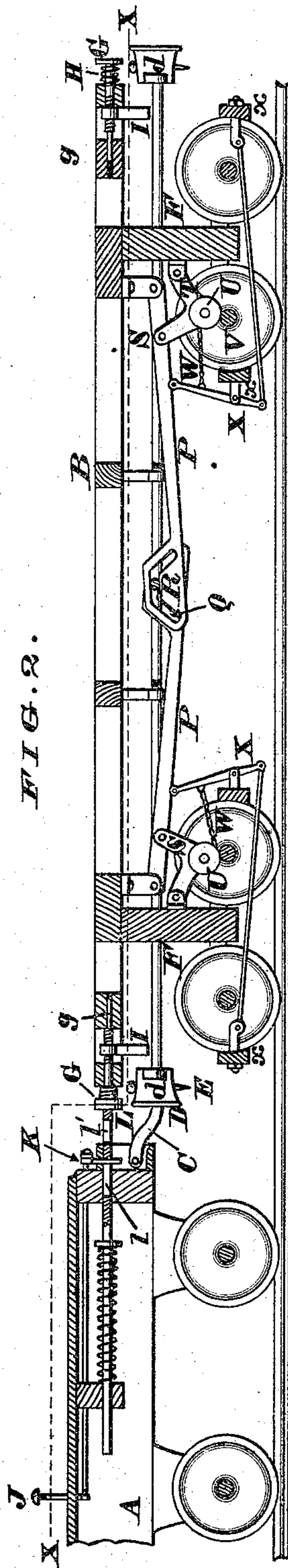
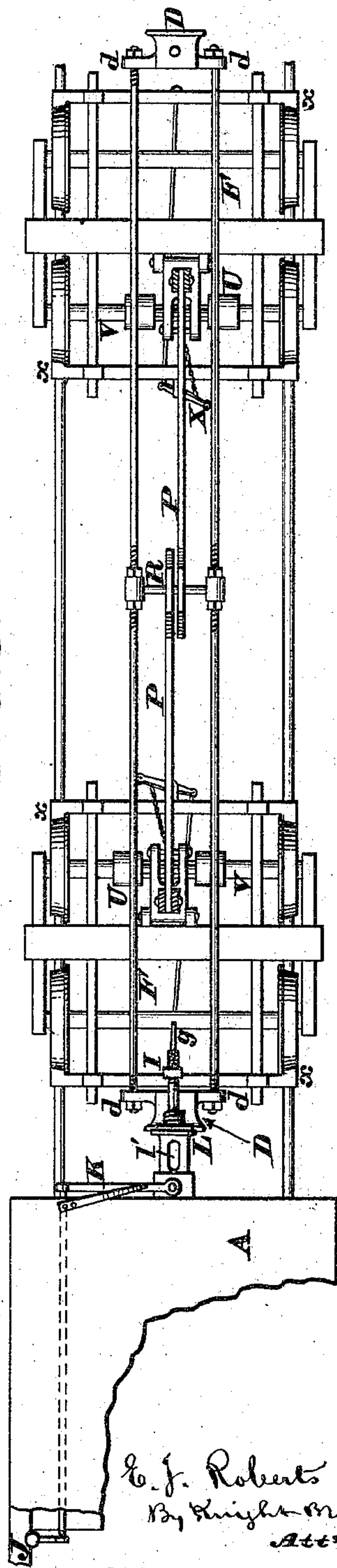


FIG. 3.



E. J. Roberts  
By Knight Bros.  
Att'ys.  
Attest.  
Jas. H. Learyman,  
Notary Public.

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FIG. 4.

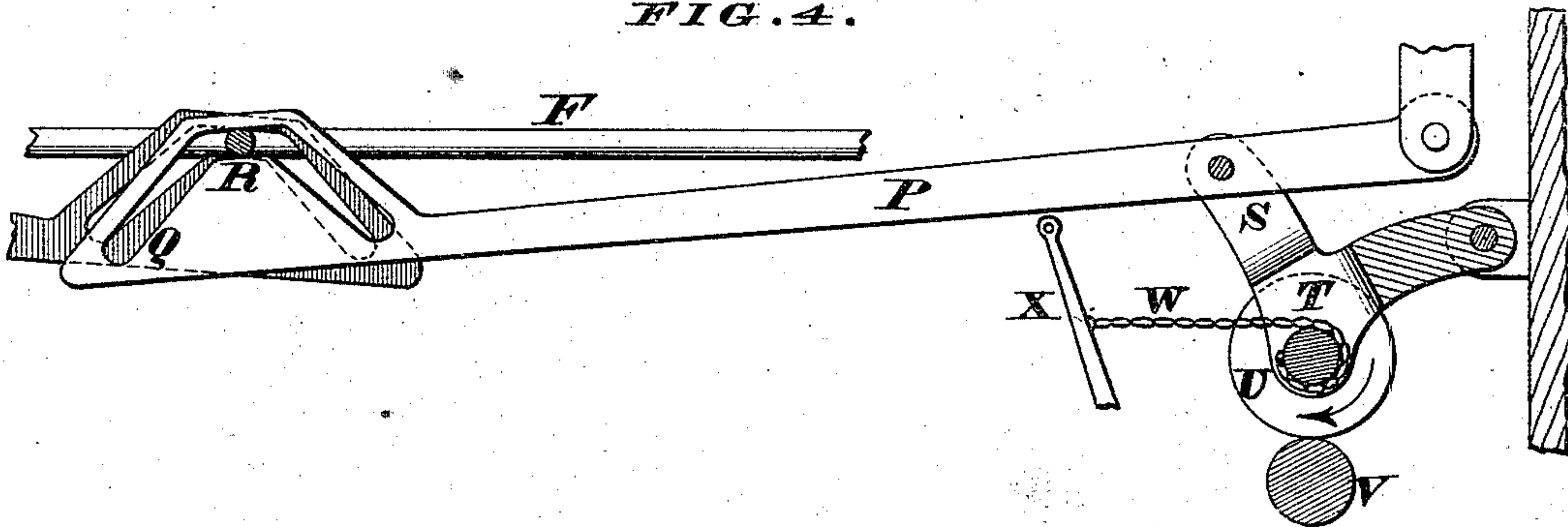


FIG. 5.

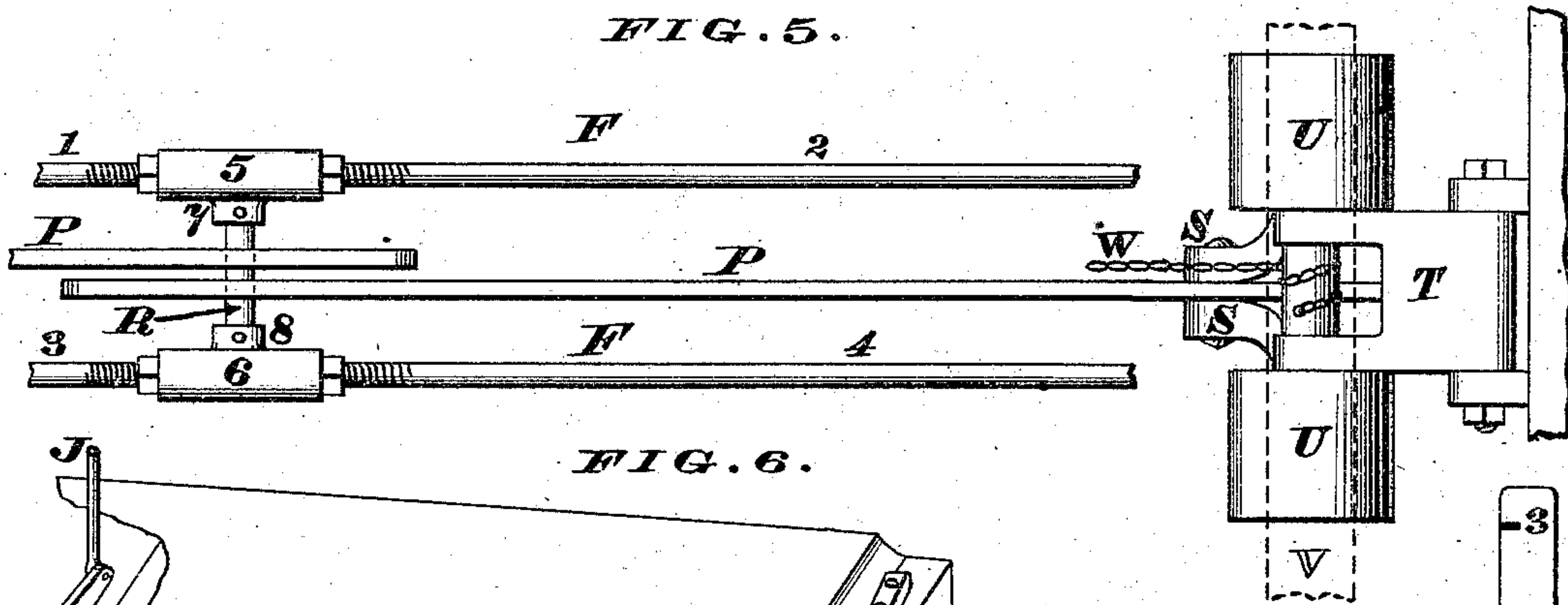


FIG. 6.

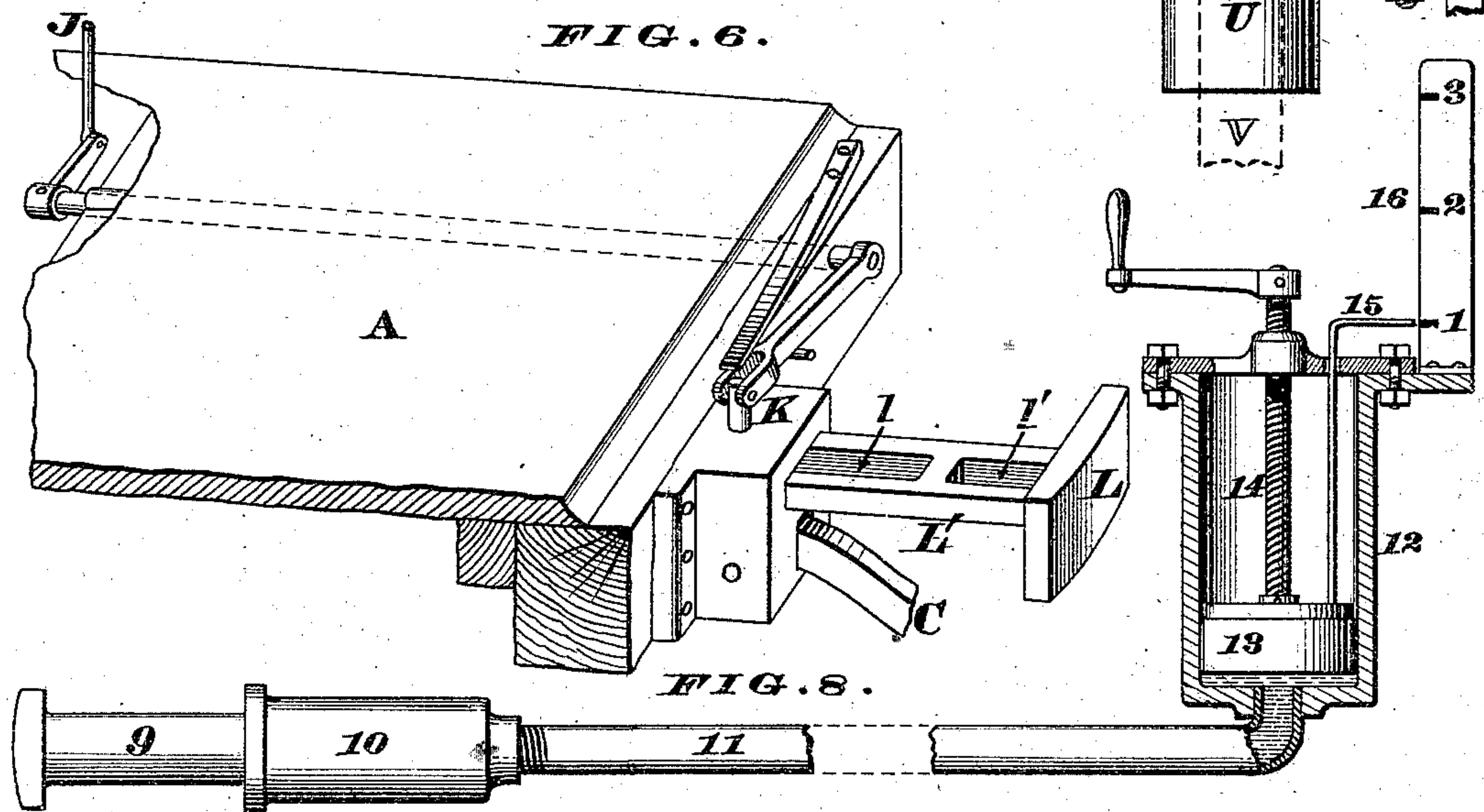
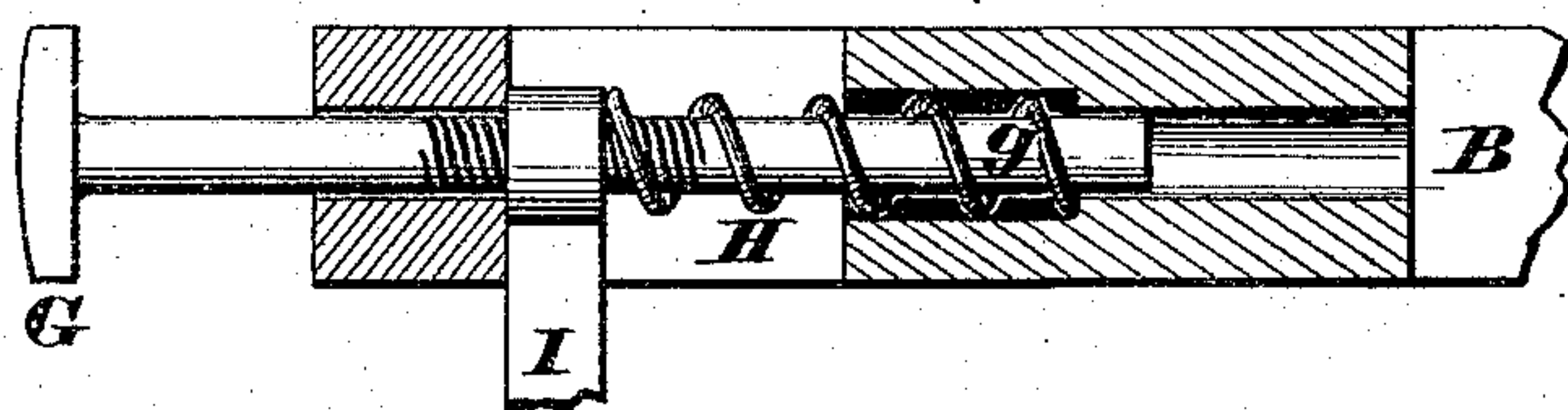


FIG. 8.



FIG. 7.



Edward J. Roberts  
By *Knightrm Att'ys.*  
Attest.  
 *Jas. H. Layman*  
 *Henry Tanner.*



# UNITED STATES PATENT OFFICE.

EDWARD J. ROBERTS, OF ASHLAND, KENTUCKY, ASSIGNOR TO HIMSELF,  
A. JOHN BELL, AND EDWARD M. NORTON, OF SAME PLACE.

## IMPROVEMENT IN CAR-BRAKES.

Specification forming part of Letters Patent No. **160,717**, dated March 9, 1875; application filed  
January 13, 1875.

*To all whom it may concern:*

Be it known that I, EDWARD J. ROBERTS, of Ashland, Boyd county, Kentucky, have invented certain new and useful Improvements in Railroad-Car Brakes, of which the following is a specification:

My improvements are in the class of railroad-car brakes which, at the option of the engineer, are made capable of automatic action throughout the train the instant that the cars crowd the engine.

In the accompanying drawing, Figure 1 is a longitudinal vertical section of a railroad-car and portion of a tender embodying my invention, my adjustable tender-buffer being shown in its retracted condition, and the self-acting brake movement being consequently not in condition for action. Fig. 2 is a similar section, showing the tender-buffer protruded and the self-acting brake-movement in operation. Fig. 3 is a partially-sectionized plan of the same on the line *x x*. Fig. 4 is a side elevation, and Fig. 5 a plan, of my brake-lever and its accessories. Fig. 6 is a perspective view of my tender-buffer and accessories. Fig. 7 is a longitudinal vertical section of one of my car-buffers, with a portion of its tappet, whereby the spring of the buffer is made effective to cushion the draw-bar. Fig. 8 is a partially sectioned elevation, showing a modification of my tender-buffer.

This modification will be the subject-matter of another application for Letters Patent.

A represents a portion of the tender body, and B a portion of a car body. The tender may have the usual inseparable coupling to the locomotive, and may itself be provided with customary brakes, operated by steam or otherwise. The tender is, in like manner, inseparably coupled, by means of ordinary or any suitable coupling C D E, to the draw-bar F of the foremost car. The draw-bar of each car extends from end to end of the car, with respect to which it is capable of a stroke of about twelve inches. The draw-bars of the consecutive cars are inseparably coupled throughout the train. When coupled, the cars abut against one another throughout the train by means of yielding bumpers G, having customary helical or other springs H. The

rod *g* of each car-bumper has a downwardly-projecting tappet, I, which, receiving the concussion of the draw-head D, transmits the same to the buffer-rod *g*, whose spring H is thus made effective to cushion both draw-head and buffer.

In order to enable the engineer to place the automatic brake mechanism either in or out of condition for action, I provide a spring-bolt, K, which, by means of a treadle, J, convenient to the engineer's foot, is made to occupy either one or the other of two slots, *l* and *l'*, in the shank L' of a tender-buffer, L, which is maintained to its desired protrusion by means of a customary or other spring, M. For example, when it is desired that the brake mechanism shall be in condition for automatic action, the said spring-bolt is made to occupy the slot *l* farthest from the buffer-head, so as to allow the maximum protrusion of said head, while, on the other hand, for suspension of the said automatic action, said bolt is made to enter the slot *l'* nearest the buffer-head, so as to allow a less degree of protrusion. Pivoted to each end of each car body is a lever, P, whose free extremity has a double incline slot, Q, which is traversed by a pin, R, that projects from the draw-bar. This lever is linked or pivoted at S, to a frame, T, that has one or more friction-rollers, U, which, when depressed by the sinking of the said lever P, bear against one of the car-axles, V, and become effective to wind up a chain, W, which, being connected to a customary or any suitable double brake movement, X, operate to bring the brake-shoes *x* into effective contact with the peripheries of the car-wheels, and arrest the motion of the train with a degree of promptness and force proportionate to the crowding action. The lever P is made of such weight that, on the accidental separation of the car from the train, the lever drops of its own accord and puts the brakes into instant operation. But a lever or winch may be provided which, by enabling the brakeman to shift the draw-bar to one or other end of its stroke, will operate to lift the brakes and leave the car free to travel, if desired.

The operation of my improvement is as follows: The train being coupled and the spring-



bolt *k* occupying the rearmost slot *l'*, the automatic brake mechanism is thereby rendered inoperative, so as to give the engine the advantage of the slack motion afforded by the unrestricted end play of the draw-bars *F*—say, twelve inches, more or less—whereby impetus is accumulated wherewith to start the train. The train having been started, the automatic brake mechanism may now be put in condition for effective action, and to accomplish this purpose the engineer places his foot on the treadle *J*, so as to release the tender-bumper *L*, which accordingly springs out to its maximum protrusion, upon which the engineer, releasing the treadle, thereby permits the spring-bolt to drop into the foremost slot *l*.

The slot *l* is of such length as to permit a play or longitudinal motion of either engine or train relatively to each other, equal to the half-stroke of the draw-bars—say, six inches, more or less—or, in other words, to crowd to this extent one on the other, accompanied by a corresponding relative motion of the train of cars and their respective brake-levers, and the passage of pin *R* thereon from the forward extremity to the apex of the double incline slots *Q* in the free end of the power-brake levers *P*, and, by forcing the latter down, to bring the brakes into action, and to maintain them therein so long as the crowding action continues, and with a force proportionate thereto. The effect is to promptly relieve the crowding, and retard the train so as to restore the pin *R* to its original position at the forward ends of the slots *Q*, and to elevate the levers *P*, and thereby release the brakes, to be, however, again made effective at any moment by a repetition of the same causes. If, now, the engineer should see danger ahead, and should desire to back the train, he has but to momentarily withdraw the spring-bolt *K* from the tender-bumper, his hands being at liberty to handle the reverse-lever and throttle, so as to retard the engine, and, by crowding the train, to press the tender-bumper forward. The spring-bolt, being then released, drops into the rear slot *l'*, and the engine, being now reversed, operates to push the draw-bars completely backward, causing the pin *R* to occupy the remote extremity of the slot *Q*, and permitting the engine to crowd the train to any extent without braking. In this condition of the parts the train can be reversed at full speed, or backed up hill. Should the engineer, while backing, desire to restore the automatic brake arrangement—as, for example, on reaching a down grade—he momentarily slackens speed, and, with his foot on treadle *J*, releases spring-bolt *K*, permitting it to drop into the forward slot *l*; then, by slightly crowding the train, the pin *R* is again brought to the vertex of the slot *Q*, causing down-brakes. The only difference, therefore, in the automatic braking action in backing and in advancing is that, in the latter case, said action is effected by the

train crowding the engine, and in the former by the engine crowding the train.

In the above arrangement it is intended that the entire train of cars shall move backward or forward as a nearly solid body relatively to the engine and draw-bars, the limit of said motion being six inches when the tender-rubber is set for automatic braking, and twelve inches at other times. In traversing the latter distance the depression of the power-lever over the apex of slot *B* is too instantaneous to affect the brakes.

It will be seen that my system of self-acting brakes in no wise interferes with the use of the customary or any approved hand connection, whereby each individual car may be subject to the control of a brakeman located upon it. The device is, however, designed to dispense with the major number of these officers by putting the braking power under control of the engineer, who is the only person competent to apply preventative measures with adequate promptness and certainty.

My preferred construction of draw-bar for the above purpose is that of four rods, 1 2 3 4, whose outer extremities are screwed into lugs *d* projecting laterally from the draw-heads *D*, and whose inner extremities are screwed into coupling-thimbles 5 6, into whose bosses 7 8 the pin *R* is inserted and firmly secured by means of pins 7.

I claim as new and of my invention—

1. The combination of the tender-buffer *L*, rigidly secured to shank *L'*, having slots *l l'* and spring-bolt *K*, as and for the purpose set forth.

2. The combination of head *L*, slotted shank *L' l'*, spring *M*, spring-bolt *K* and treadle *J*, substantially as and for the purpose set forth.

3. In combination with a longitudinally-adjustable bumper, the series of carriage-buffers *G*, the slotted rods *P Q*, the pin *R*, and the draw-bars *F*, which extend the full length of their respective cars, and which operate on the braking mechanism at the middle of their stroke, substantially as and for the purpose set forth.

4. The combination of a longitudinally-adjustable bumper with a draw-bar, capable of being shifted to full or to half stroke, pin *R* on said draw-bar, and brake-levers *P*, whose free ends have the double incline slot *Q*, substantially as and for the purpose set forth.

5. The combination of double incline slotted lever *P* and braking apparatus *S T U V W X x*, substantially as set forth.

6. The combination of double-headed draw-bar *D F D*, tappets *I*, and buffers *G H g*, as set forth.

In testimony of which invention, I hereunto set my hand.

EDWARD J. ROBERTS.

Attest:

GEO. H. KNIGHT,  
JAMES H. LAYMAN.