

(No Model.)

4 Sheets—Sheet 1.

W. P. PICKARD.  
AUTOMATIC CAR BRAKE.

No. 435,633.

Patented Sept. 2, 1890.

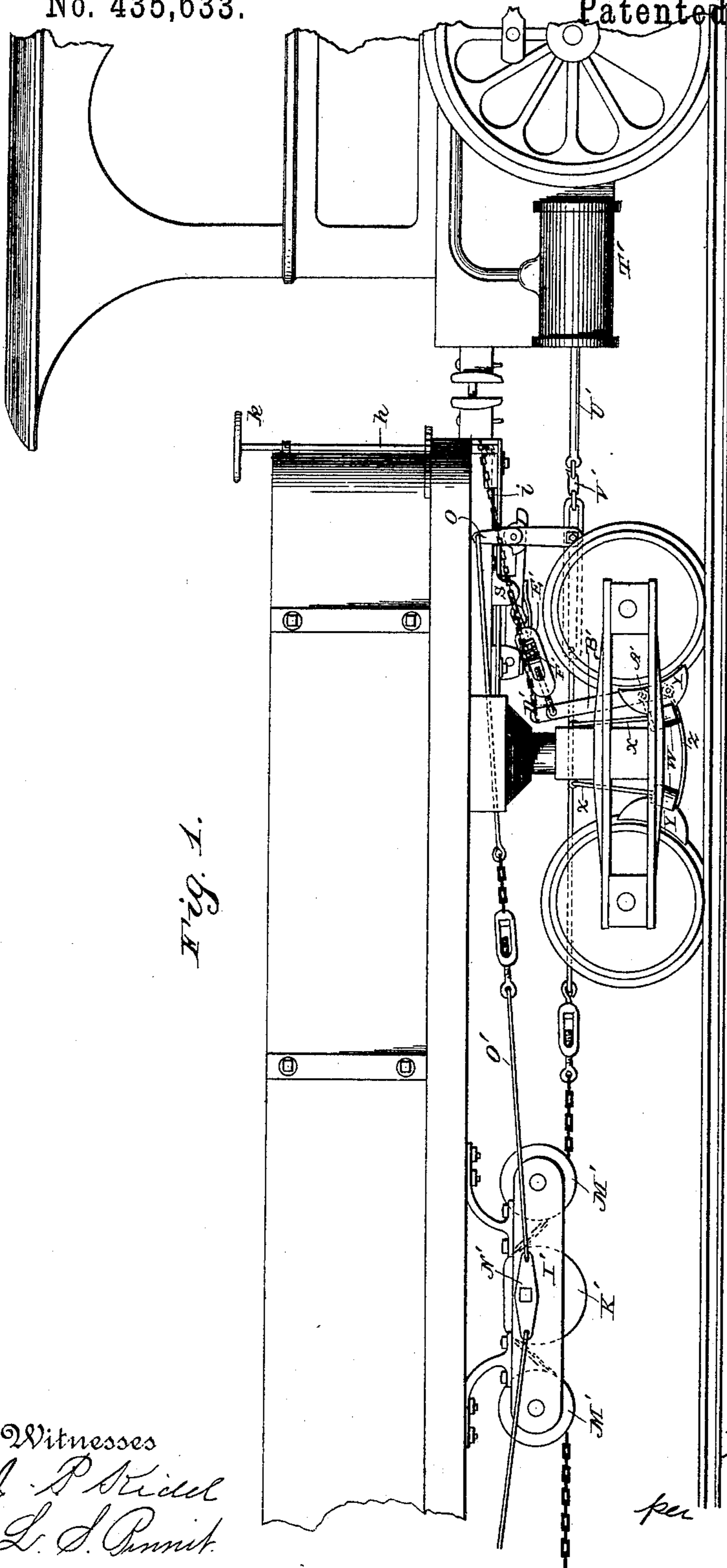


Fig. 1.

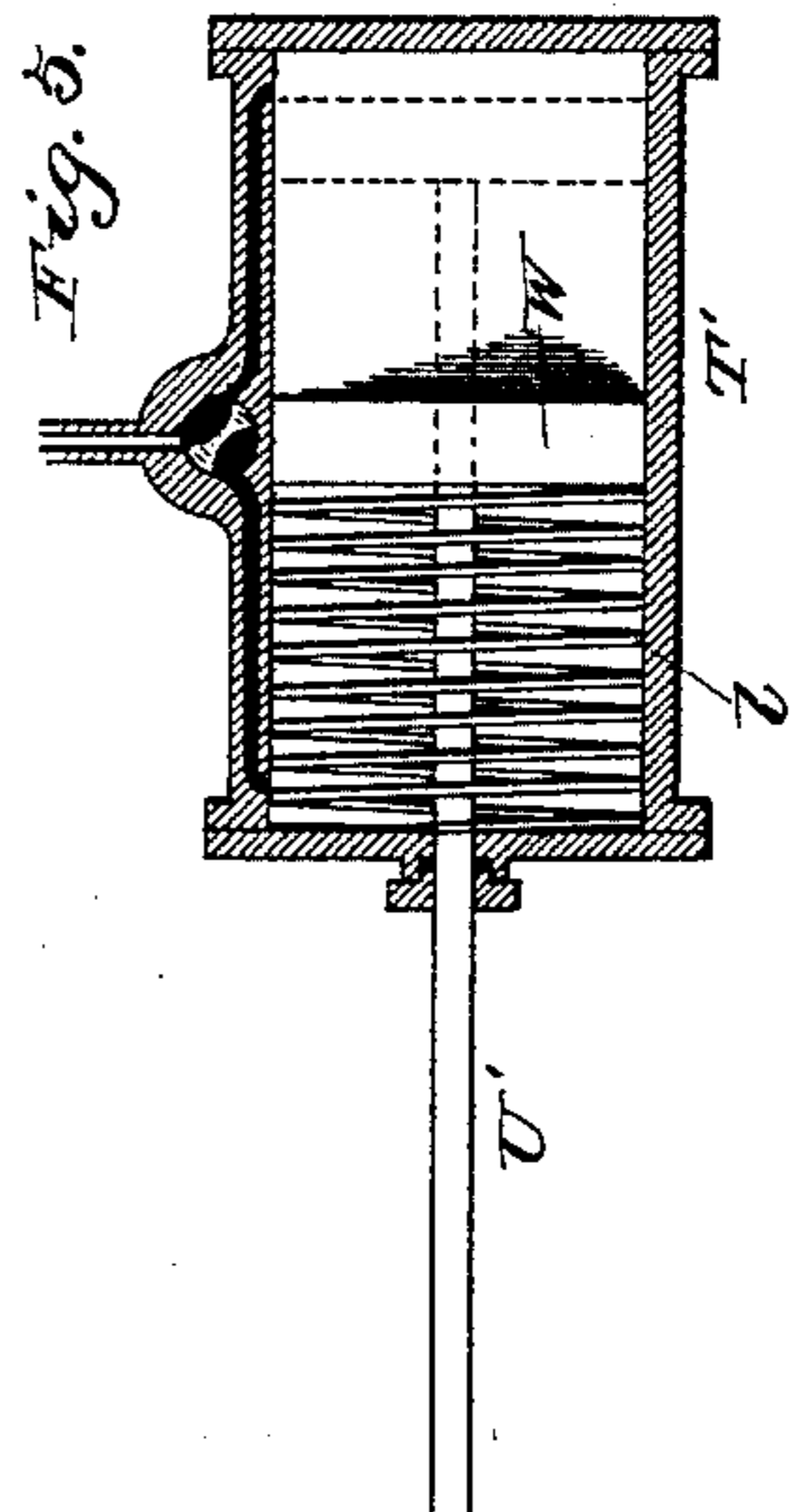


Fig. 5.

Witnesses  
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L. S. Punnet.

Inventor  
Wm. P. Pickard  
per Arnell & Bullock  
Attorneys.

(No Model.)

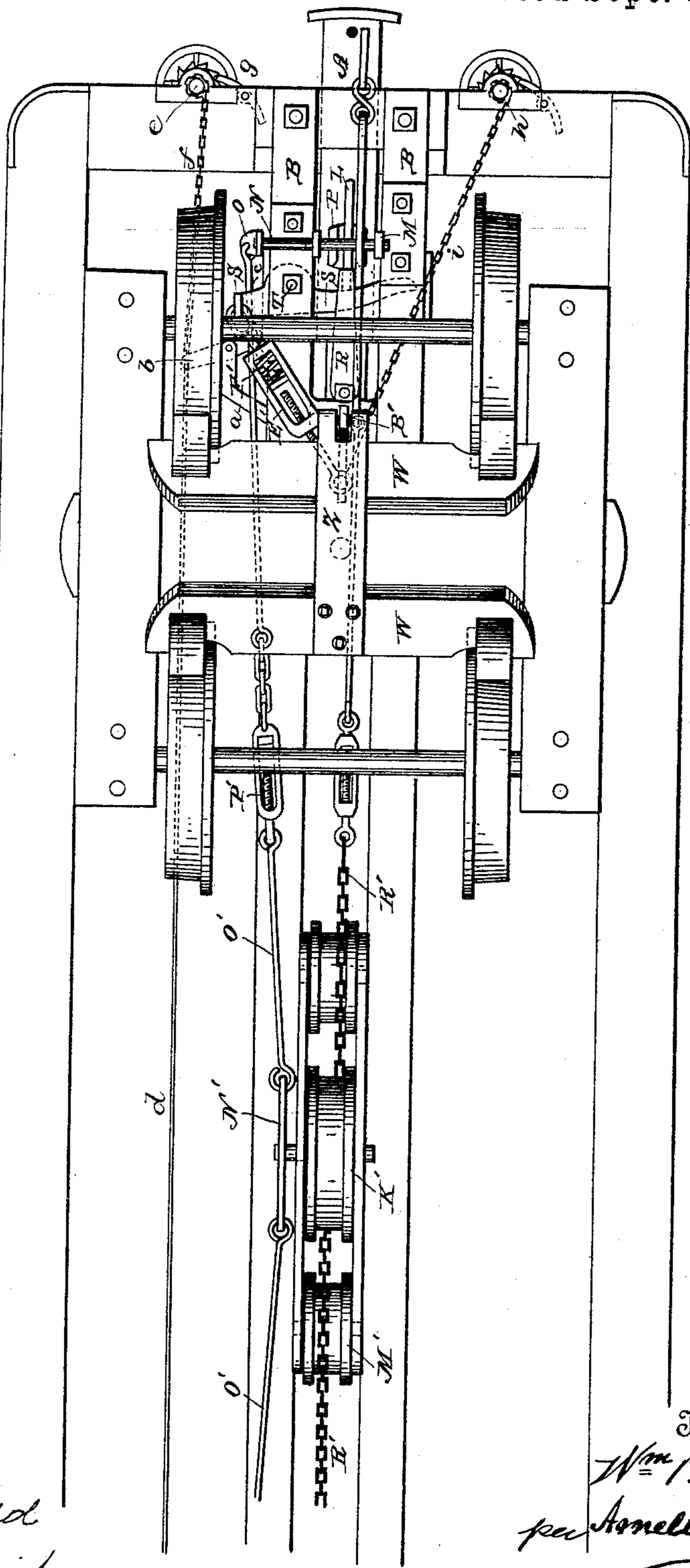
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Fig. 2.



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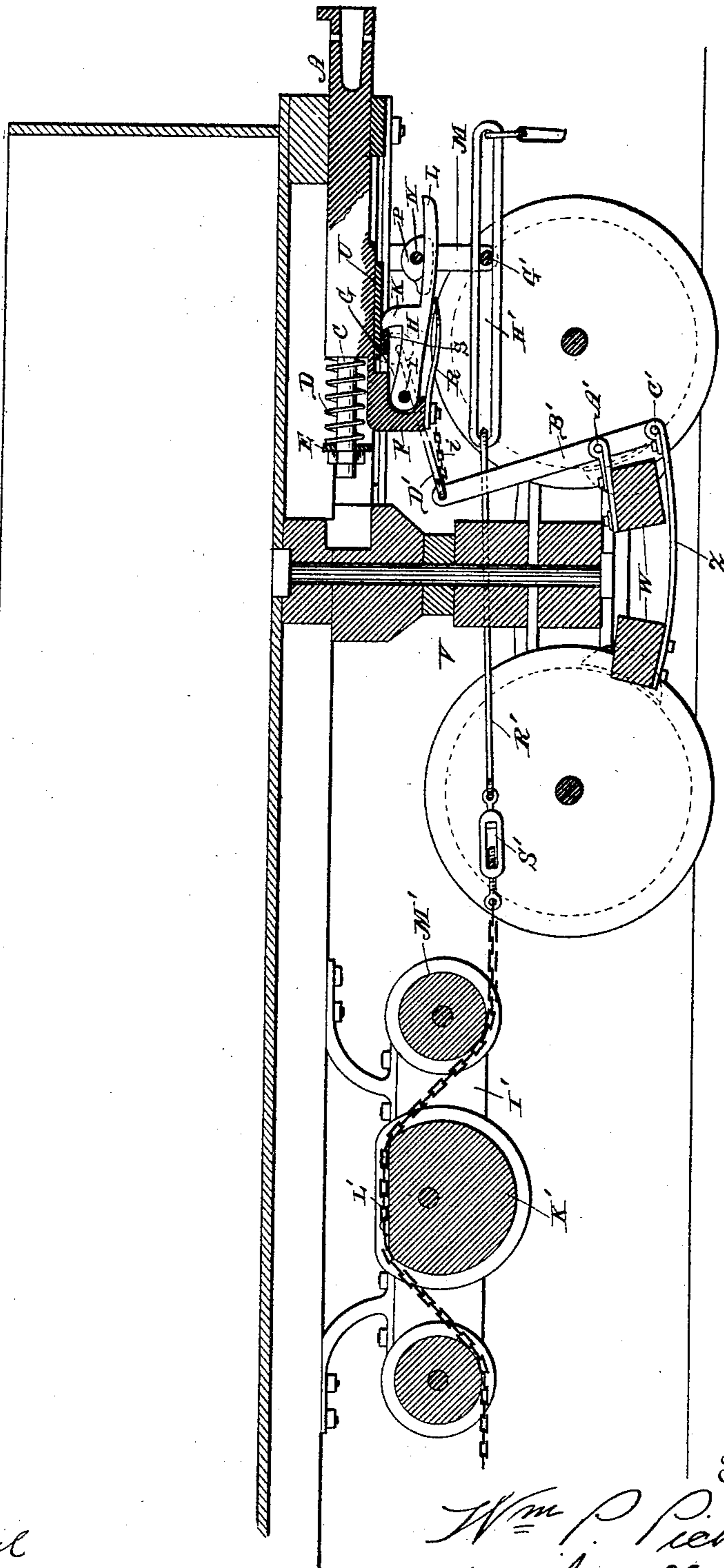
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Fig. 3.



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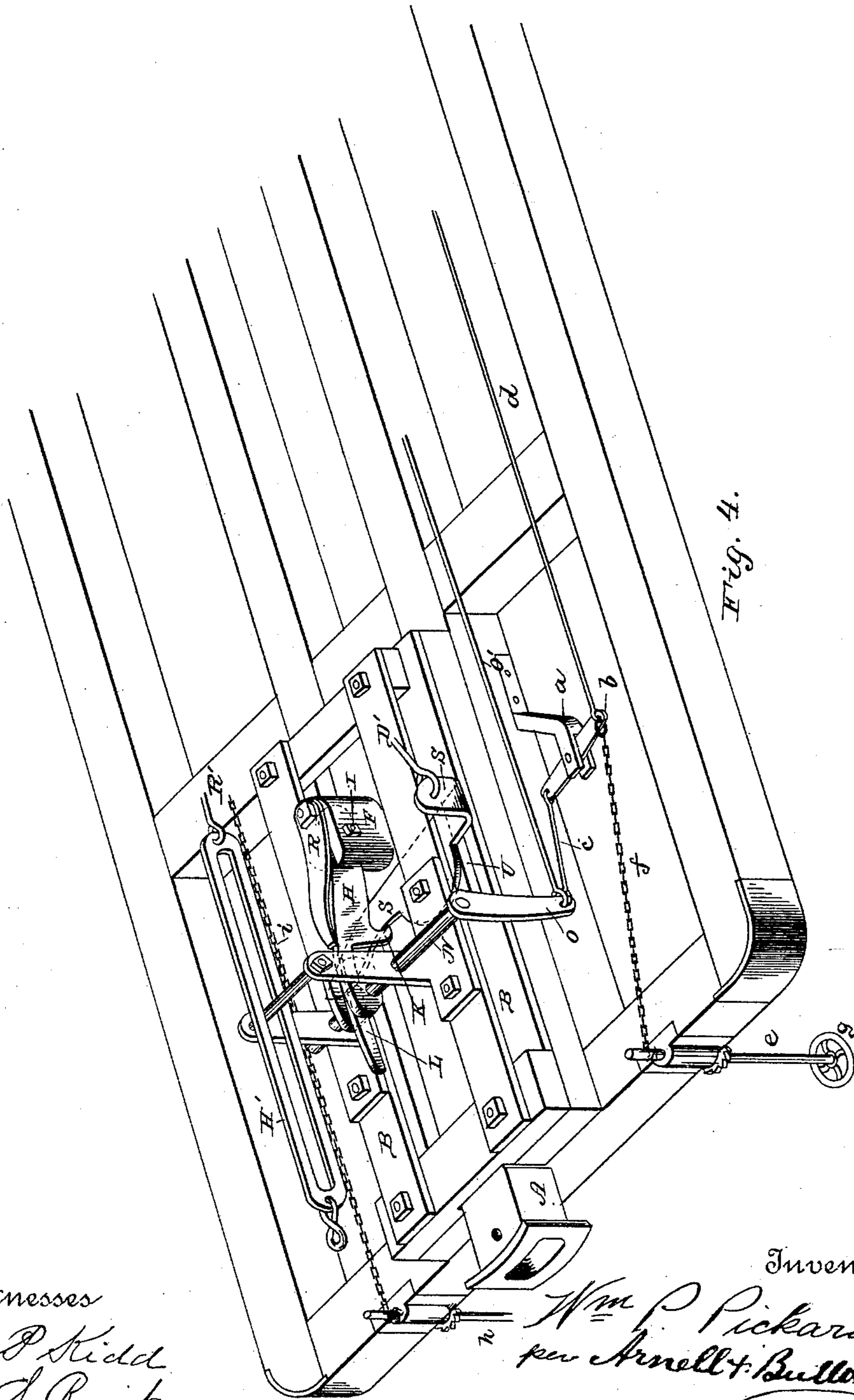


Fig. 4.

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# UNITED STATES PATENT OFFICE.

WILLIAM PAISLEY PICKARD, OF SUMMERTOWN, TENNESSEE.

## AUTOMATIC CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 435,633, dated September 2, 1890.

Application filed May 16, 1890. Serial No. 352,026. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM PAISLEY PICKARD, a citizen of the United States, residing at Summertown, in the county of Lawrence and State of Tennessee, have invented certain new and useful Improvements in Automatic Car-Brakes; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to an improvement in automatic car-brakes; and it consists in the peculiar construction and combination of devices, that will be more fully set forth hereinafter, and particularly pointed out in the claims.

The object of my invention is to provide an apparatus which is adapted to automatically apply the brakes to the wheels of a railway-car when the train is descending a grade; and a further object of my invention is to provide devices whereby the brake apparatus may be thrown out of gear and caused to cease to operate.

In the accompanying drawings, which illustrate my invention, Figure 1 is a side elevation of a portion of a car and of a locomotive provided with my improved automatic brake apparatus. Fig. 2 is a bottom plan view of a portion of a car provided with my improved brake. Fig. 3 is a vertical central longitudinal sectional view of the same. Fig. 4 is an inverted perspective view of the brake apparatus, showing the same attached to one end of the car, the truck of the latter being omitted. Fig. 5 is a detail section of the steam-cylinder.

The draw-head A, which is of suitable construction, is longitudinally movable in guides B at the end of the car, and from the rear end of the draw-head projects an extension or rod C, on which is arranged a coiled extensible spring D, which bears against the rear end of the draw-head and against a plate E, which is arranged transversely between the guides. The said spring forms a buffer and serves to keep the draw-head normally ex-

tended beyond the end of the car in the position shown.

Formed integrally with the rear portion of the draw-head and depending therefrom is a hanger F, in which is an opening G that extends to the front side of the said hanger. In the said opening is arranged the rear end of the hook H, the said hook being pivoted on the bolt or rod I, arranged transversely in the hanger, and said hook has on its upper side an engaging-arm K, and is provided with a forwardly-extending arm L.

A pair of brackets M depend from the guides B, and journaled in the said brackets is a transverse rock-shaft N, which is provided at one end with a crank O. On that portion of the rock-shaft between the brackets is arranged a cam P, which has a longitudinal channel in its lower face, into which the arm L of the hook H is fitted, and the said hook is kept normally elevated with its arm in engagement with the bottom of the said channel by means of the spring R, the said spring being secured at its rear end to the lower side of the hanger F. It will be understood from the foregoing that the said pivoted hook, being attached to a portion of the draw-head, is movable longitudinally with the latter.

A lever S is pivoted near one end on a bolt T, and is arranged transversely in the guides B, and extends directly under the cross-head, being separated from the latter by a transverse plate U, which connects the guides. The said lever S is arranged in the path of the arm K of hook H, and is normally engaged by the same, and consequently when the draw-head is forced inward against the resistance of the spring D the lever is partly turned on its pivot, as will be readily understood.

The car-trucks V are of the usual or any suitable construction, and each truck is provided with a pair of brake-bars W, the said brake-bars being arranged on the inner sides of their respective wheels and being suspended by means of supporting-links X. Suitable brake-shoes Y are attached to the ends of the brake-bars, and are adapted to bear against the peripheries of the wheels. To the rearmost brake-bar is attached a link-arm Z, which extends forward under the foremost brake-bar, and is entirely detached and

independent of the latter, as shown most clearly in Fig. 3, and to the said foremost brake-bar is attached a bracket A', which serves as the fulcrum for the brake-lever B'.

5 The short arm of the said brake-lever is pivotally connected to the link-arm Z, and the long arm of the brake-lever is connected to the short arm of lever S by means of the rod D'. A swivel E' is arranged in the said rod, 10 and in the said swivel is a buffer-spring F', adapted to take up slack, the said spring being of suitable strength and designed to yield under violent strain.

The operation of this portion of my invention is as follows: Each car in a train is provided with my improved brake apparatus, and when the train is in motion or starts to descend a grade, and when the engineer applies the brake to the locomotive-wheels, the 20 instant that the speed of the locomotive is checked the foremost car will be caused by its inertia to thrust its draw-head rearward, and as the draw-head moves rearward its hook H partly turns the lever S and causes the rod 25 D' to draw upon the brake-lever and move the brake-bars from each other simultaneously in opposite directions, and consequently applies the brakes to the inner faces of the wheels, as will be readily understood. Each car in 30 succession, as the speed of its predecessor is checked, is caused by its inertia to apply the brakes in the manner before described, this operation being repeated by each car in succession throughout the entire train.

35 It is of importance to provide means for throwing the brake apparatus out of gear in order to enable the train to be backed and to prevent the brakes from being applied when the train is descending easy gradients, 40 and it is also important to adapt such means to be operated by the engineer at will. I have devised means to accomplish these results, and I will now proceed to describe the same. The lower ends of the brackets M are connected by rods G', and on the said rods are 45 arranged longitudinally-movable slotted links H', one of these links being under each end of each car. Under the center of each car is a carrier-bracket I'. In the center of the 50 bracket is journaled a drum K', which has a plane or flat upper face L', and at each end of the bracket is journaled a sheave or guide pulley M', said sheaves and the said drum being provided with peripheral grooves. To 55 one end of the shaft of the drum is attached a yoke N', and the extremities of the said yoke are connected to the cranks O of the rock-shafts N under the ends of the car by means of link rods or chains O'. Included in each 60 link rod or chain is a turn-buckle P' to take up slack therein. The inner ends of the slotted links H' are connected to the drum K' by link rods or chains R', as shown, and in each of the said link rods or chains is included a 65 turn-buckle S' to take up slack. On the locomotive is arranged a steam-cylinder T', in which is fitted a piston and a valve to admit

steam to either end of the cylinder at the will of the engineer, and the rod U', attached to the said piston, is connected to the slotted 70 link H' of the foremost car in the train by means of an open spring-link V', as shown, and the said slotted links are connected together at the ends of the cars by similar open 75 spring-links throughout the entire train. The piston in cylinder T' is normally moved rearward to relieve the link-rods R' of tension and maintain the drums K' with their yokes N' in a horizontal position, so that the link-rods O' maintain the cranks O in a vertical 80 position. When thus adjusted, the hooks H remain in engagement with the levers S in the manner before described, and consequently the brake apparatus is in gear throughout the entire train and ready to operate 85 automatically, as before stated. When it is desired to throw the brake apparatus out of gear, the engineer admits steam to the rear end of cylinder T and causes the piston W' to move forward therein, and consequently 90 draw upon the foremost slotted link H', which, being connected to the drum K' by the link or chain R', causes said drum to partly rotate, and the yoke N' turns with the said drum and causes the link rods or chains O' to turn the 95 cranks O rearward or toward each other, and said cranks turn the rock-shafts N and the cams P, and the said cams depress the hooks H and disengage the arms K of the latter from the levers S, and consequently the draw-heads are permitted to be forced inward without moving the said levers S, and hence the 100 brakes are not applied by such movement of the draw-heads. The spring-links V' uncouple without injury to the brake apparatus 105 in case the train parts.

I will now describe my improved apparatus for throwing the brakes out of gear by hand-power and adapted to be operated by a 110 train-man stationed on a platform of any car of the train, thus enabling a car to be controlled by hand when disconnected from a train, or in the event that it should become separated therefrom by the parting of a coupling and to provide against accidents in the 115 event that the steam apparatus on the locomotive should get out of order. Under the bottom of each car and near each end thereof is arranged a bracket-arm a, in the outer end of which is pivoted a lever b. One end of 120 the said lever is connected to the proximate crank-arm O by a rod c, and the two levers b on each car are connected together by a rod d. A hand-winch e of the usual construction is arranged at each end of the car, and 125 each of the said hand-winch is connected to the inner end of the proximate lever b by a chain f. Hence by turning the winch-wheel g at either end of the car the levers b will be operated and cause the crank-arms O to 130 throw the brake apparatus out of gear, as will be readily understood.

It is also essential to provide the cars with hand-brake apparatus for use when the cars

are disconnected and in the event of injury to the automatic brake apparatus, and I will now describe the improved hand-brake apparatus that I have devised for this purpose.

5 At either end of the car is a hand-winch *h*, of the usual construction, and the lower end of the winch-shaft is connected to the proximate brake-lever *B'* by a chain *i*. By operating the winch-wheel *k* at either end of the  
10 car the brakes may be applied by hand, and hence every car in the train is capable of being controlled in the event that it should become uncoupled or should it be necessary in case of accident.

15 In Fig. 5 I show a coiled spring *l*, arranged in the rear end of the cylinder *T'* and bearing against the rear side of the piston *W'*. When steam is on, this spring performs no function in operating the throw-off brake-gear; but when the steam is turned off this  
20 spring moves the piston forward in the cylinder to the position shown in dotted lines, thereby throwing the brake apparatus in position for operation, as will be readily understood.

25 Having thus described my invention, I claim—

1. The combination, in an automatic car-brake, of the longitudinally-movable draw-head, the lever *S*, connected to the brake apparatus, and the hook *H*, connected to the draw-head and adapted to engage said lever *S*, substantially as described.

2. The combination, in an automatic car-brake, of the longitudinally-movable draw-head, the lever *S*, connected to the brake apparatus, the hook *H*, connected to and movable with the draw-head and adapted to engage the lever *S*, for the purpose set forth, and means, substantially as described, to disengage the said hook from the said lever *S*, substantially as described.

3. The combination, in an automatic car-brake, of the lever *S*, connected to the brake apparatus, the longitudinally-movable draw-head, and the connecting device between the draw-head and the said lever *S*, and adapted to engage and disengage the latter at will, for the purpose set forth, substantially as described.

4. In an automatic car-brake, the combination of the lever *S*, connected to the brake apparatus, the longitudinally-movable draw-head, the spring-pressed hook *H*, connected to the draw-head and adapted to engage the lever, the cam *P*, engaging the hook, and means, substantially as set forth, to operate the cam, and thereby disengage the hook from the lever, substantially as described.

5. The combination, in an automatic car-brake, of the brake apparatus having the lever *B'*, the lever *S*, the link connecting said lever *S* to the brake-lever and having the buffer-spring *F'*, the longitudinally-movable draw-head, and the connecting device between the draw-head and the lever *S* to operate the latter, substantially as described.

6. The combination, in an automatic car-brake, of the longitudinally-movable draw-head, the hook *H*, attached thereto, the lever *S*, adapted to be engaged by the hook, the brake apparatus connected to the said lever and operated thereby, the cam to disengage the hook from the lever *S* to throw the brake apparatus out of gear, the drum, the links attached to the drum and adapted to be coupled between the cars; and connections, substantially as described, between the drum and the cam to operate the latter, substantially as described.

7. The combination, in an automatic car-brake, of the longitudinally-movable draw-head, the lever *S*, connected to the brake apparatus, the hook attached to the draw-head and adapted to engage the said lever, the rock-shaft having the cam and the crank, the said cam being adapted to trip the hook from the lever *S*, the drum having the lever connected to the crank, and the link-rods attached to the drum adapted to partly rotate the same, and means, substantially as set forth, to connect said links between the cars, substantially as described.

8. In combination with the trip or disengaging devices of an automatic car-brake, the slotted links to operate said devices, and the open spring-links to connect said slotted links between the cars, for the purpose set forth, substantially as described.

9. In combination with the lever *S* and engaging hook *H*, constituting the trip or disengaging devices of an automatic car-brake, the steam-cylinder, the piston therein connected to the said devices, and means to admit steam to either end of the cylinder, substantially as described.

10. In combination with the lever *S* and engaging hook *H*, constituting the trip or disengaging devices of an automatic car-brake, the steam-cylinder, the piston therein, connected to the said devices, means to admit steam to either end of the cylinder, and the spring to normally move the piston to one end of the cylinder when steam is off, substantially as described.

11. The combination, with the automatic brake apparatus, of the levers *b*, connected thereto, and the hand-winch connected to the said levers, substantially as described.

12. In combination with the automatic brake apparatus having the crank-arms *O* and the disengaging devices, the levers *b*, connected to the said crank-arms, the rod connecting said levers together to cause them to move simultaneously, and the hand-power apparatus connected to one or both of the levers *b*, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM PAISLEY PICKARD.

Witnesses:

D. E. CRAIG,  
JO. P. KIDD.