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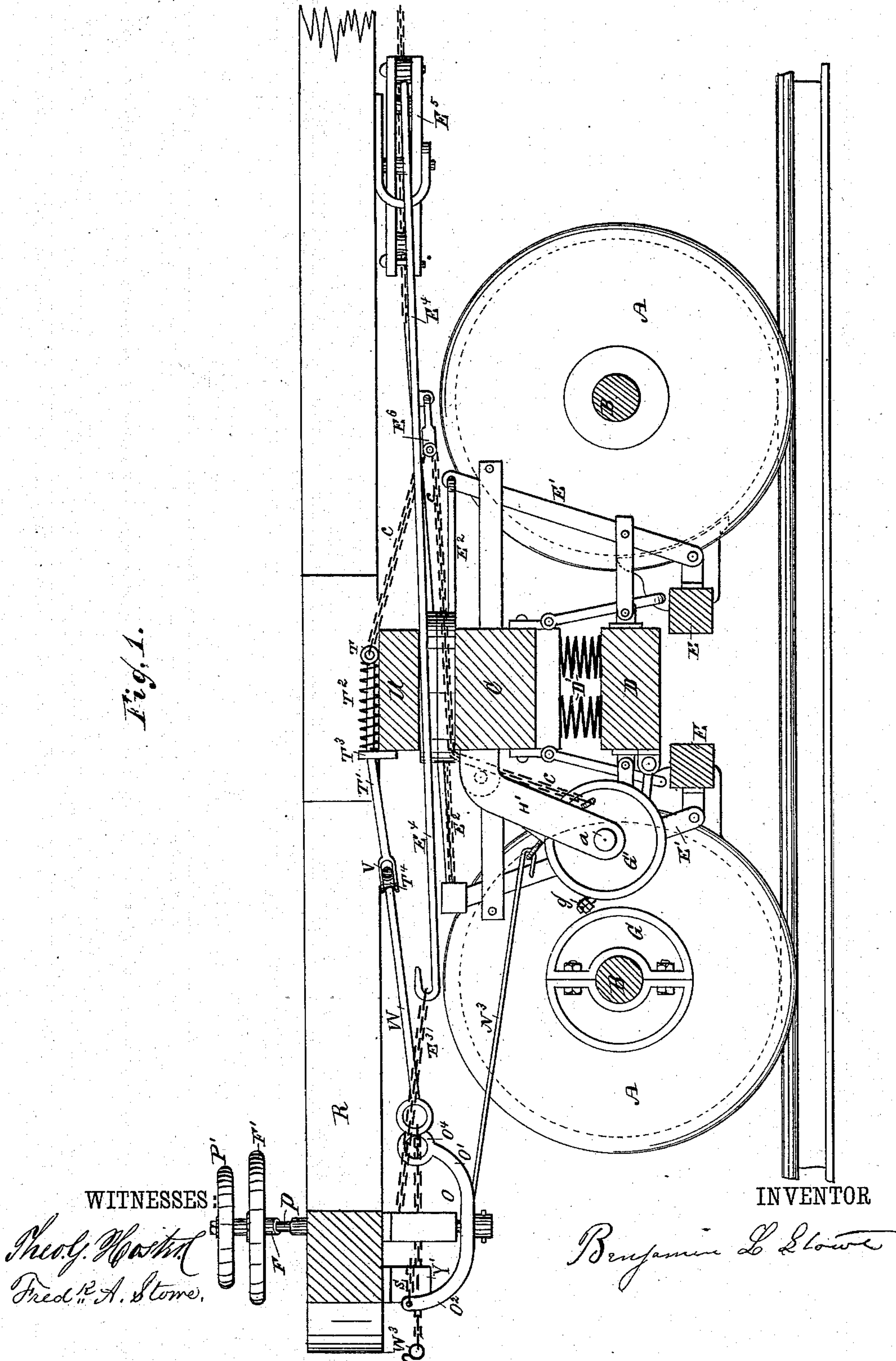
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B. L. STOWE.
AUTOMATIC CAR BRAKE.

No. 272,097.

Patented Feb. 13, 1883.

Fig. 1.



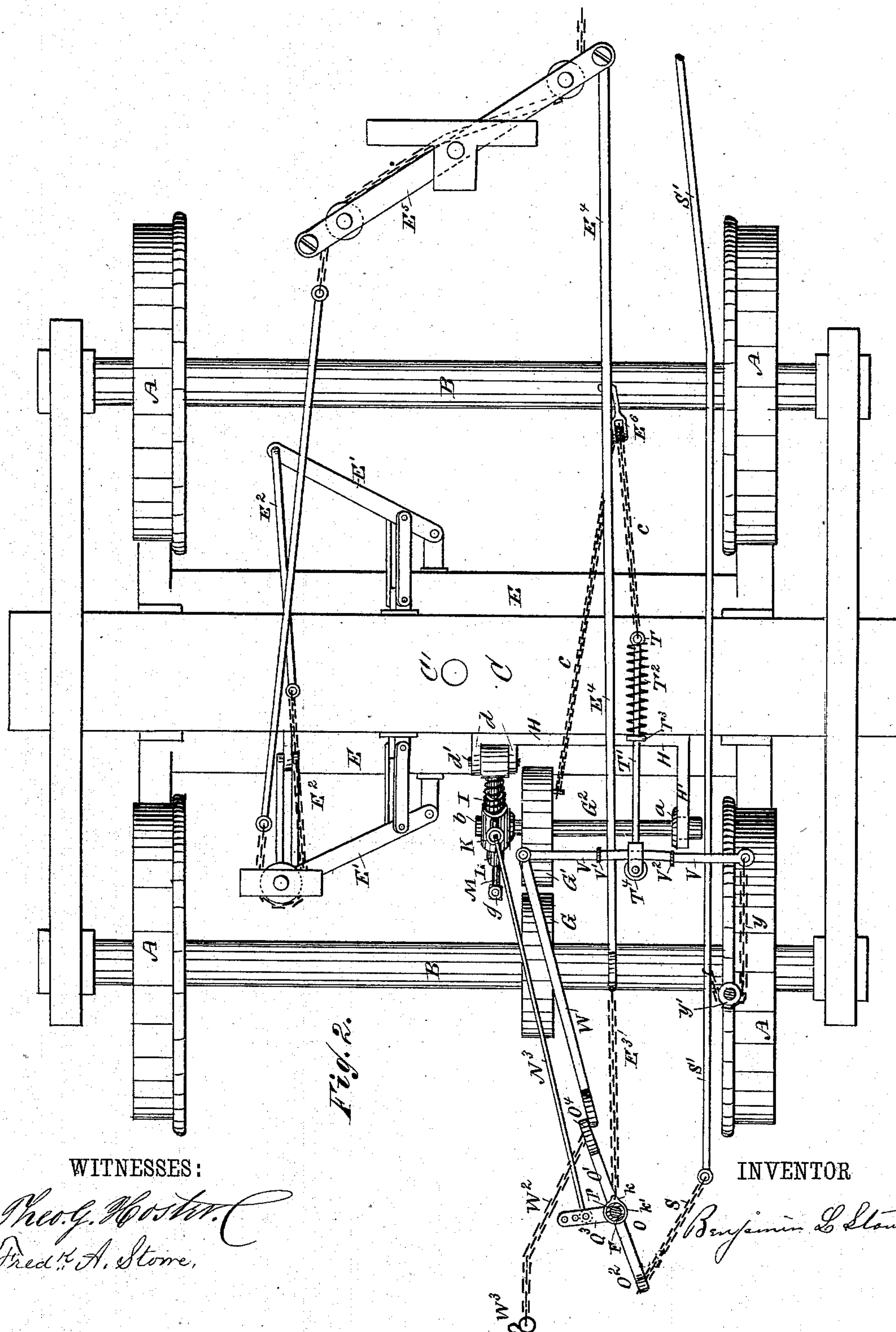
(No Model.)

4 Sheets—Sheet 2.

B. L. STOWE.
AUTOMATIC CAR BRAKE.

No. 272,097.

Patented Feb. 13, 1883.



WITNESSES:

Theo. G. Hooster.
Fredk. A. Storre.

INVENTOR

Benjamin L. Stowe

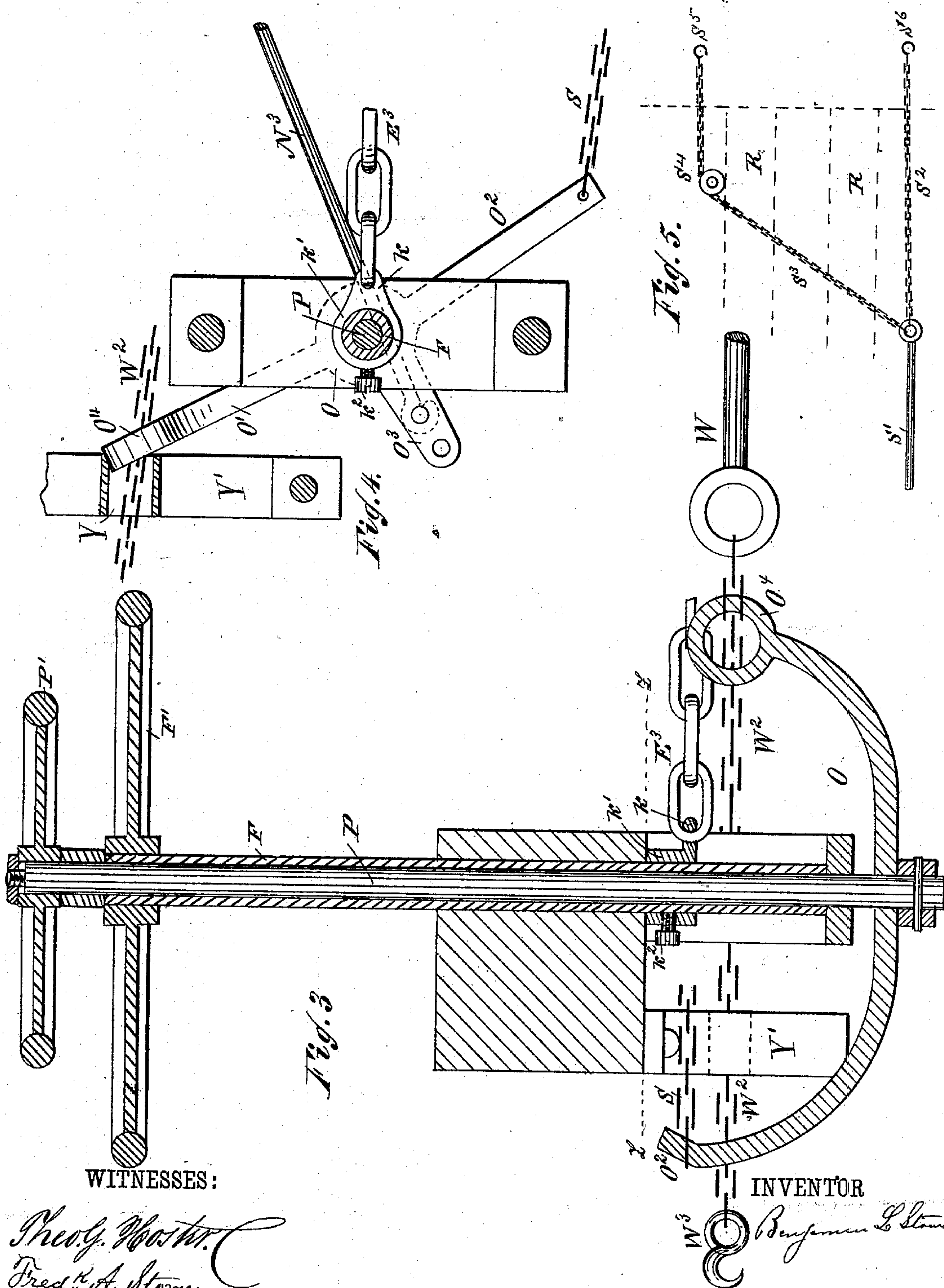
(No Model.)

4 Sheets—Sheet 3.

B. L. STOWE.
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N. PETERS, Photo-Lithographer, Washington, D. C.

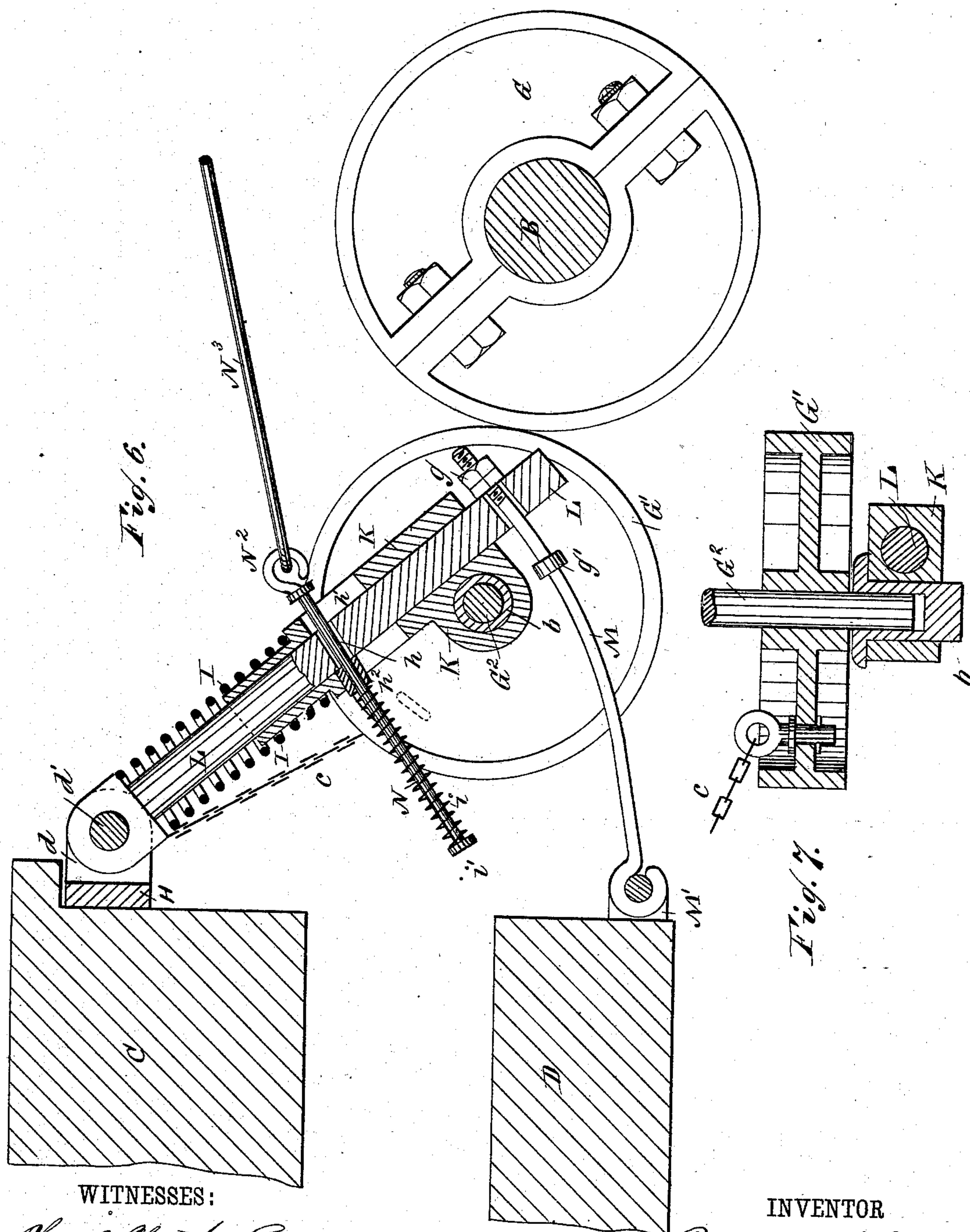
(No Model.)

4 Sheets—Sheet 4.

B. L. STOWE.
AUTOMATIC CAR BRAKE.

No. 272,097.

Patented Feb. 13, 1883..



WITNESSES:

Theo. G. Foster.
Fred. A. Stone.

INVENTOR

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UNITED STATES PATENT OFFICE.

BENJAMIN L. STOWE, OF NEW YORK, N. Y., ASSIGNOR TO J. VAN D. REED,
OF SAME PLACE.

AUTOMATIC CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 272,097, dated February 13, 1883.

Application filed January 23, 1882. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN L. STOWE, a citizen of the United States, residing at New York, in the county and State of New York, have invented new and useful Improvements in Automatic Car-Brakes, of which the following is a specification.

My invention relates to improvements in that class of brakes which are made continuous in their character by means of a connecting chain or rod which joins the brake mechanism of one car to that of another, in distinction from those of the class for which Letters Patent of the United States have already been granted me, Nos. 231,115 and 231,116, dated August 10, 1880, and Nos. 245,576 and 245,577, dated August 9, 1881, and No. 250,852, dated December 13, 1881, and in which the brake mechanism of one car is entirely independent in its operation of that of any other car; but the two forms of brake have otherwise many features which are similar in principle, although of somewhat different forms of construction.

In the accompanying drawings, forming a part of this specification, Figure 1 is a sectional side elevation of so much of a car of a usual construction as is necessary to illustrate my invention, the car-wheels upon one side and a portion of the truck-frame being removed to expose the brake mechanism to view. Fig. 2 is a plan of the car-truck with my improved brake mechanism attached thereto. Figs. 3, 4, 5, 6, and 7 are detailed views.

The car-wheels A, the axles B, the truck-bolster C, the spring-plank D, the springs D', the brake-beams E, the levers E', chains and rods E², E³, and E⁴, center brake-lever, E⁵, and all other parts of the car and truck frames, except the hand-brake shaft F, are of a usual construction.

The hand-brake shaft F, as shown, is, for convenience of construction, made of a hollow tube, and through its center I pass another shaft pertaining to my improved brake mechanism, and which will be hereinafter described.

The friction-drum G, clamped upon the axle B in a usual manner, the drum G', the automatic brake-shaft G², the sleeve a, the bracket

H, the relief-spring I, the journal-bearing K, and the sleeve b and chain c are similar in principle to those described in the drawings and specifications of the aforesaid Letters Patent which were granted to me, but are of a somewhat modified form. The bracket H, fastened to the truck-bolster C, has at one end a rigid arm, H', which extends downward and forward, and supports one end of the brake-shaft G², the sleeve a passing loosely through the arm H', and the end of the said shaft G² entering the said sleeve a. At the other end of the bracket are two projecting lugs, d d, set a little way apart, and upon a pin, d', extending through and between them, is hinged a swinging shaft, L, which carries the relief-spring I, the journal-bearing K, and, through the medium of the said bearing K and the sleeve b, supports an end of the automatic brake-shaft G². The swinging shaft L, while it is free to swing a limited distance at its lower end in a direction lateral with the automatic-brake shaft G², and consequently will permit the pulley G' upon the shaft G² to approach or recede from the drum G upon the car-axle, has no motion longitudinally with the brake-shaft G².

Through an opening in the lower end of the swinging shaft L passes a rod, M, which is arranged to limit the amount of swing of the said shaft L, the nuts g, upon the outer end of the rod M, being made adjustable, so that the contact of the drums G and G' can be regulated to a certain extent by them.

The stop-piece g', which limits the backward motion of the shaft, may be fixed upon the rod M. This rod M is preferably curved to the radius upon which the lower end of the shaft L swings. The rear end of the rod M is pinned loosely to a piece, M', fastened to the spring-plank D.

The journal-bearing K slides loosely up or down upon the swinging shaft L, subject to the stress of the relief-spring I, and restricted in the amount of its movement by the draft-rod N, which passes through a hole, h, in the swinging shaft L and a longitudinal slot, h', in the journal-bearing K.

A spool, h², larger than the hole h through

the swinging shaft L, and a spring, *i*, encircle the draft-rod N to the rear of the swinging shaft L and between the said shaft and a head, *h'*, upon the draft-rod.

5 The front end of the draft-rod N has an eye, N², into which hooks an end of another draft-rod, N³. This draft-rod N³ is joined at its other end to the short arm O³ of a cross-piece, O, which is fastened upon the lower end of the
10 shaft P, that passes through the center of the hand-brake shaft F. The eye N² of the draft-rod N should be as nearly as possible in a direct line with the center-bolt O' of the truck and the brake-shaft P. Enlarged views of
15 this cross-piece O and its shaft P and the hand brake shaft F are shown in detail views, Figs. 3 and 4.

The cross-piece O consists of three arms—two long ones, O' and O², opposite one another, and
20 the short one, O³, projecting at a right angle from midway between the two longest ones, O' and O². This cross-piece O is pinned to the lower end of the vertical shaft P. The said shaft passes up longitudinally through the hol-
25 low hand-brake shaft F, and has a hand-wheel, P', upon its top.

The hand-wheel F' of the hand-brake and the hand-brake shaft F itself externally are of a usual construction; but the chain E³, which
30 is usually fastened to an eyebolt which passes laterally through the hand-brake shaft, is in the present case fastened to an eye, *k*, in collar *k'*, which encircles the shaft F, the said collar *k'* being prevented from turning by a set-
35 screw, *k*², or by a key.

Both of the arms O' and O² are curved upward, and the one which is nearest the draw-
40 timber R of the car has a large eye, O⁴, at its end. To the other arm O² is fastened one end of a chain, S, the other end of the said chain being fastened to the end of a rod, S', which reaches toward the other end of the car.

The automatic brake-chain *c* reaches from the pulley G', to which one of its ends is secured,
45 up over the bolster C and back, and is passed through a sheave, E⁶, hooked onto the hand-brake rod E⁴, and then forward, and is secured to an eye, T, in the end of a rod, T'. The eye T is large enough to prevent a spring, T²,
50 from slipping over it. The rod passes loosely through a small piece, T³, bolted onto the body-bolster U. The front end of this rod T is bifurcated and a small sheave, T⁴, is placed between its forks.

55 A lever, V, which is set at right angles to the rod T, passes behind the sheave T⁴, and two stop-pieces, V' and V², upon the lever V, are set sufficiently far apart, one upon each side of the sheave T⁴, to allow the sheave to roll
60 along upon the lever for a limited distance—say about one-third of its length.

To the end of the lever V, nearest the draw-
65 timber R, is fastened loosely one end of a rod, W, whose other end reaches forward to the large eye O⁴ upon the arm O'. The eye is made too large to be drawn through the eye O⁴; but a

chain, W², which is secured to it, passes forward through the eye O⁴, and then through a ring, Y, Fig. 4, which is set upon the upper
70 side of the draw-bar hanger Y'. This chain W² has a hook, W³, upon its end, by which it can be joined to a like hook upon another car, and it should be of a length sufficient to have its slack taken up when the lost motion
75 allowed by the couplings between the cars is taken up. The hook W³ is sufficiently large to prohibit its being drawn back through the ring Y upon the draw-bar hanger Y'.

A chain, *y*, is fastened to the outer end of the lever V, which passes forward and around
80 a sheave, *y'*, attached to the truck-frame or other suitable stationary part of the car, and then back, and is fastened to the rod S'.

The parts just described were described and shown in drawings as being in their normal
85 positions—*i. e.*, the position in which they will be when the brake is inoperative; but the positions of many of them are changed when the brake is applied—as, for instance, the cross O may be turned to the left until the eye O⁴
90 strikes the draw-bar hanger Y', (see Fig. 4,) when the short arm O³ will have carried the end of the draft-rod N³ around until it draws in a line a little outside of the center of the cross O, instead of inside, as previously de-
95 scribed. This motion will have also brought the draft-rod N³ forward sufficiently to have brought the drums G and G' together with all the force which the stress of the spring *i* will permit, and the pull of the draft-rod N³ upon
100 the arm O³ in a line outside of the center will serve to hold the cross in its position with the eye O⁴ against the draw-bar hanger Y'. Either one end or the other of the lever V may be
105 drawn forward or back.

For convenience of coupling the brake-
chains of two cars together the rod S', at some point before it reaches the end of the car, may be divided into two branches of rod or chain,
110 S² and S³, Fig. 5, so that they may be run out upon both sides of the draw-bar of a car through eyes upon the hangers similar to eye Y upon the hanger Y', already described. Sheaves S⁴ or other guides may be used to guide the said
115 rods or chains.

The chain S² and hook S⁶ are similar to chain W² and hook W³.

The method of operation of the mechanism described is as follows: When a train of cars equipped with this brake is being "made up,"
120 the draft-chains W² S² of each car will be hooked to the contiguous draft-chains of adjoining cars at its front and rear. When the brake is inoperative the draft-chains are without too much slack, but are not drawn tight.
125 Now, if the train be running and it is desired to apply the brake throughout the train, the engineer is enabled to do it by pulling the chain W² of the car nearest the locomotive a few inches, (which he can do by mechanism
130 upon the locomotive which it is not necessary at this time to describe,) or until the cross-

piece-O is turned around sufficiently to cause the drums G and G' to be brought into contact by means of the short arm O³ and the draft-rod N³. This contact of the drums G and G' will cause the automatic-brake shaft G² to be rotated and the chain c wound upon the shaft G². This chain c serves the double purpose of applying the brake by means of its pull upon the sheave E⁶, attached to the hand-brake rod E⁴, and also of causing the brake mechanism of the next car in the train to be operated by means of its draft upon the rod T' and the lever V. The lever V is so arranged that an outward pull upon either chain W² or chain S² separately will cause an inward pull upon the chain S² or chain W² not so pulled, the rod T', sheave T⁴, spring T², and piece T³, fastened to the body-bolster U, serving as an elastic fulcrum for the lever V. If both chain S² and chain W² are pulled simultaneously, the spring T² will yield sufficiently to prevent the breakage of lever V or chains W² or S². When one of the chains W² or S²—as, for instance, chain W²—is pulled the end of the lever V, to which it is fastened, will be drawn forward, and this will cause the sheave T⁴ upon the draft-rod T' to travel toward the stop V² upon the lever V farthest from the end of the lever V, to which said chain W² or its rod W is fastened, so that when the chain c, rod T', and sheave T⁴ pull upon the lever V a greater portion of the power will be received by the chain S² than by the chain W².

The device just described is intended not only to take up any slack that there may be in chain S², but also to compensate for the amount of draft upon the chain W² consumed in operating the cross O and its connecting mechanism.

If, instead of the chain W² being pulled from the engine or another car, a brakeman stationed upon this car had turned the cross O by means of the hand-wheel P', and brought the drums G and G' into contact, thereby causing the brake to be applied, then the sheave T⁴ would have remained in the center of the lever V, and the pull of the sheave T⁴ upon the lever V would have been transmitted in equal proportions to each of the chains W² and S², and the operation would have caused the brake mechanism of two adjacent cars—one in front and one in the rear of this one—to be operated. The lever V may be slightly curved between the stops V' and V² to facilitate the sheave T⁴ in finding the center of the lever V when there is no unequal strain upon the lever V.

In giving the foregoing description I have supposed that there was a sufficient pull upon the chain W² to turn the cross O only far enough to bring the pulleys G and G' into contact, with pressure enough to apply the brake without carrying the draft-rod N³ beyond the center of the cross O sufficiently to hold the pulleys G and G' together when the pull upon

the chain W² is released. This will always be the case when the chain W² is pulled while the cars are coupled together, as the amount of draft upon the chain W² will be limited by the hook W³ of the chain W² upon the next car striking the ring Y upon the draw-bar hanger Y' of the said next car. If, however, the couplings between the cars were broken, then the length of pull upon the chain W² will no longer be limited, but the chain will be drawn out until the eye O⁴ of the cross O will strike the draw-bar hanger Y', and this will cause the draft-rod N³ to be carried beyond the center of the cross O, so that the brake cannot be released when the chain W² breaks, as it probably will do; or, rather, the hook W³ will straighten out, that being made the weakest point in the system. The result will be that the brake will have been applied upon this car, and from the pull given to the chain S² to the next car, and so on throughout the train.

Small supporting-chains (not shown) may be employed, if desired, for the better support of the lever V when the chain W² is broken.

The brake, under the circumstances above described, will remain applied until released by a brakeman by turning the hand-wheel P' and cross O backward until the draft-rod N³ again comes forward or inside of the center of the cross O. The brake may also be applied and locked at any time by the brakeman through the medium of the hand-wheel P'.

It will thus be seen that by the employment, in the manner above described, with the friction-brake-applying mechanism of one car, of draft mechanism adapted to engage or be coupled with the draft mechanism of the adjoining car, and connected with and operated by the said brake-applying mechanism, I am enabled to exert upon the friction-brake-applying mechanism of the adjoining car a pull or draft which will bring it in turn into action.

In the foregoing description I have referred to chains W² and S² as if their purposes were different; but such is not the case, except as the circumstances vary, as precisely the same results are produced so far as the application of the brake is concerned by a pull upon either end of the car.

The relief-spring I and connecting mechanism operate in this brake substantially the same in principle as the like springs described in the applications for Letters Patent hereinbefore mentioned as having been granted to me; but more especially like that described in Letters Patent No. 245,577, dated August 9, 1881, in which the friction-pulley and relief-spring are described as being in combination with mechanism arranged and operating to increase the pressure upon the relief-spring proportionately to the increase of load carried by the car; but the parts of the mechanism are somewhat modified in form to adapt it to the different construction of truck to which it is applied.

When the car is not loaded the adjusting-

nuts g upon the rod M should be set far enough out to permit the drums G and G' to be brought into contact by means of the forward pull upon the draft-rod N^3 , as previously described, but
 5 near enough so that when the relief-spring I is moderately compressed and the swinging shaft L advances a little the nuts g will act as a stop for the said swinging shaft L and prevent its further advance, thereby allowing the
 10 power of the brake to be limited by a moderate compression of the relief-spring I ; but now, if the car be loaded and the car-springs D' compressed, the relief-spring I must be compressed considerably more to allow the shaft
 15 G^2 to rise sufficiently to bring the swinging shaft L against the adjustable nuts g , and consequently considerably more brake power will be exerted when the car is loaded than when it is light.

20 In cases where a train is made up of cars, some of which are provided with this brake, while others adjoining such cars are without it, the arrangement for automatically applying the brake upon the cars that do possess it
 25 can be utilized by hooking the hook W^3 onto a platform-post, the brake-staff, or other convenient part of an adjoining car, or by dropping the coupling-pin of said adjoining car through the hook, and a piece of chain may
 30 be hooked onto the end of the chain W^2 , and used to supplement the length of said chain when it is not otherwise long enough to reach to a suitable fastening place upon the adjoining car.

35 What I claim, and desire to secure by Letters Patent of the United States, is—

1. The combination, with the brake-shoes, friction-drums, and intermediate brake-applying mechanism, of draft mechanism arranged
 40 and operating, substantially as described, to bring the friction-brake-applying mechanism into action, and compensating-lever mechanism, whereby the pull or draft received by the draft mechanism of one car is caused to be
 45 transmitted to the like mechanism of an adjoining car without loss of power or motion, substantially as hereinbefore set forth.

2. The combination, with the brake-shoes, friction-drums, and intermediate brake-applying mechanism, of the brake-applying shaft P ,
 50 or its mechanical equivalent, and draft mechanism connected to and adapted to be actuated by said shaft, and arranged and operating substantially as hereinbefore described, so that
 55 when the friction-brake mechanism of the car is brought into operation by the shaft P a draft or pull from said mechanism will be transmitted equally to like brake mechanism upon adjacent cars at both ends of said cars,
 60 substantially as and for the purposes hereinbefore set forth.

3. The combination, substantially as hereinbefore set forth, with the brake-shoes and the friction-drums and intermediary mechanism of
 65 draft mechanism arranged and operating in

the manner hereinbefore described, so that when a train of cars equipped with this brake is accidentally broken apart the brake shall be automatically applied to the cars upon either
 70 side of the point at which the train is broken, and to the other cars connected with each of the said cars, and shall remain so applied until released by a brakeman.

4. The combination of the friction-brake shaft G^2 , bracket H , and swinging shaft L
 75 with the draft-rods N and N^3 , the spring i , and the short arm O^3 , arranged to bring the friction-pulleys G and G' into operative contact by the turning of the cross O , and to lock them
 80 into such contact when the turning of the cross O has exceeded a certain prescribed limit, as and for the purposes hereinbefore set forth.

5. The combination of the two brake-shafts F and P , one within the other, one pertaining
 85 to the hand-brake and the other to the automatic brake, with the friction-drum G upon the axle of the car, the friction-pulley G' , and its shaft G^2 , substantially as specified.

6. The friction-pulley shaft G^2 , relief-spring I , and mechanism, arranged substantially as
 90 described, to regulate the power of the brake in proportion to the load carried by the car, in combination with the draft-rods N and N^3 , and the spring i , and the cross O , operated either automatically or by hand.
 95

7. The combination of the friction-brake shaft G^2 , the swinging shaft L , the rod M , its adjustable nuts g , with the draft-rods N and N^3 , and the spring i , substantially as set forth.

8. The combination, substantially as described, of a rod or chain, S' , having two
 100 branches, S^2 and S^3 , with a suitable guide, S^4 , or guides for conducting the said branches S^2 or S^3 to their respective positions upon opposite sides of the draw-bar of a car.
 105

9. The combination of the chains W^2 and S^2 with the lever V , and the rod T' , the sheave T^4 , the spring T^2 , and the piece T^3 , by means
 110 of which the outward pull upon one chain W^2 or S^2 is made an inward pull upon the other, but permitting, by means of the yielding fulcrum for the lever V , of a simultaneous outward pull upon both chains without danger of breakage,
 115 substantially as set forth.

10. The combination of the chains W^2 and S^2 ,
 120 the lever V , the stops V' and V^2 , the rod T' , and the sheave T^4 , with the friction-brake chain c for compensating for loss of power or motion in the draft of chain occasioned by slackness of chain or of power consumed in
 125 operating the cross O and its connections, substantially as hereinbefore set forth.

11. The combination, substantially as described, of the chain W^2 , the hook W^3 , and the
 130 ring Y for limiting the inward draft of the chain W^2 , as and for the purposes set forth.

12. The combination of the chain W^2 , the large eye on rod W , and the ring or eye Y for
 135 limiting the outward pull of the chain W^2 in such a manner as to cause any breakage re-

sulting from the breaking apart of the train to occur in the chain W^2 or hook W^3 , substantially as specified.

13. The combination of the friction-brake mechanism with the hand-brake mechanism by means of the friction-brake chain c , the sheave E^6 , the hand-brake rod E^4 , the rod T^v , and the piece T^3 , substantially as specified.

14. In a railway car-brake system in which the brake-applying mechanisms of the several cars composing a train are operated each from some moving part of its car, the combination of the brake-applying mechanism of a car with draft mechanism adapted to engage or be

coupled with draft mechanism on an adjoining car, and operated by said brake-applying mechanism to exert upon the draft mechanism of the adjoining car a pull or draft which shall bring into action the brake-applying mechanism of that car, substantially as hereinbefore set forth.

In testimony whereof I have hereunto set my hand this 19th day of January, 1882.

BENJAMIN L. STOWE.

Witnesses:

FREDK. A. STOWE,
ROBERT SCOBIE.