

A. I. AMBLER.

Car Brake.

No. 34,855.

Patented Apr. 1, 1862.

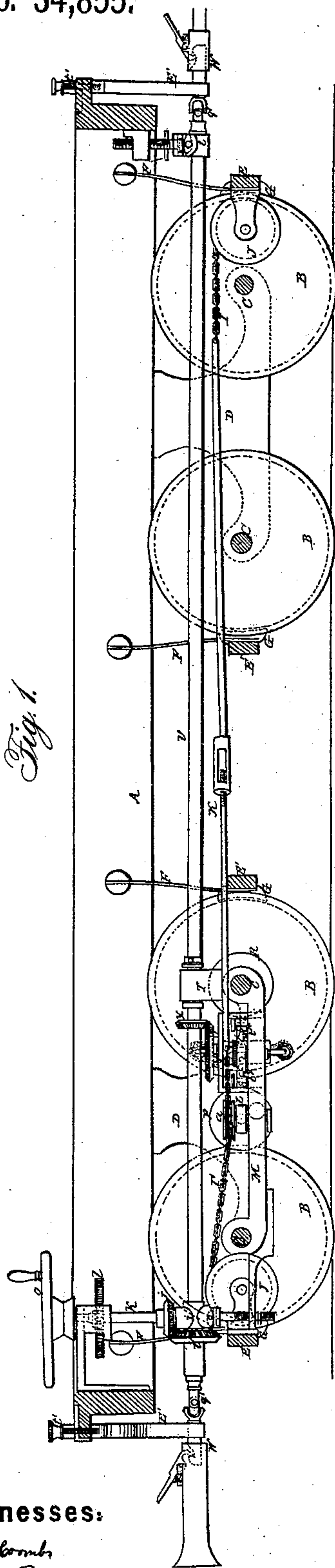


Fig. 1.

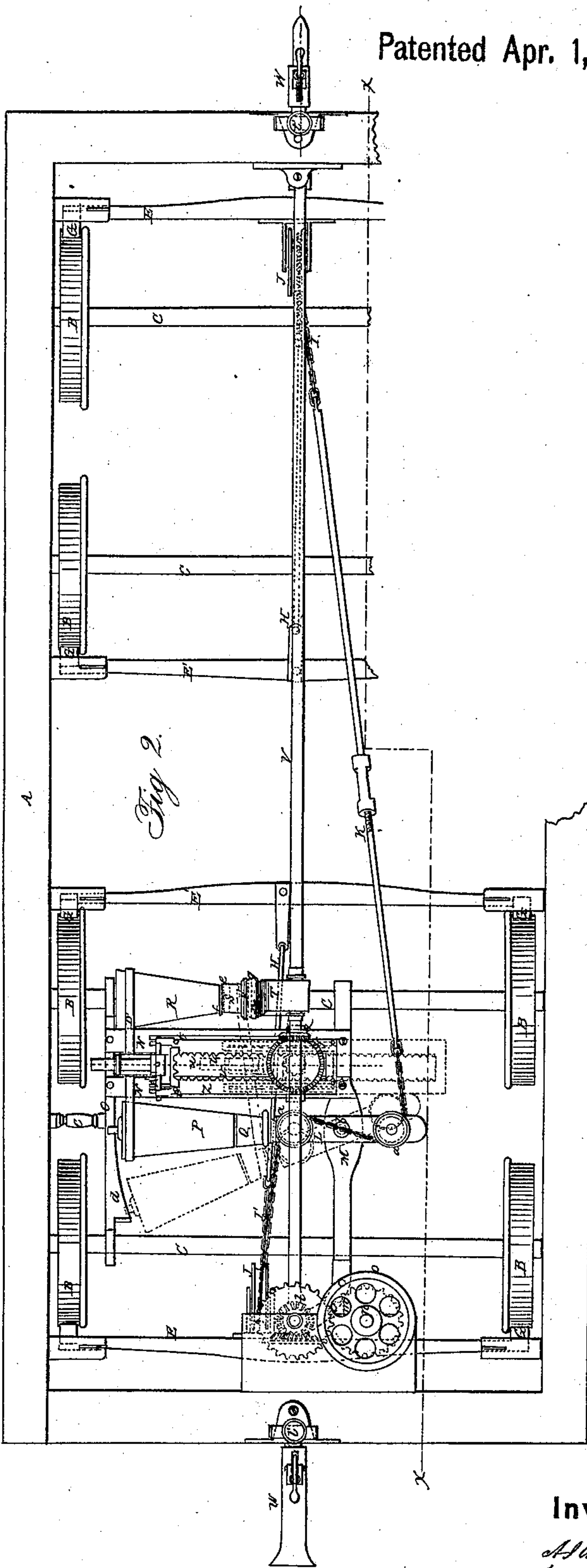


Fig. 2.

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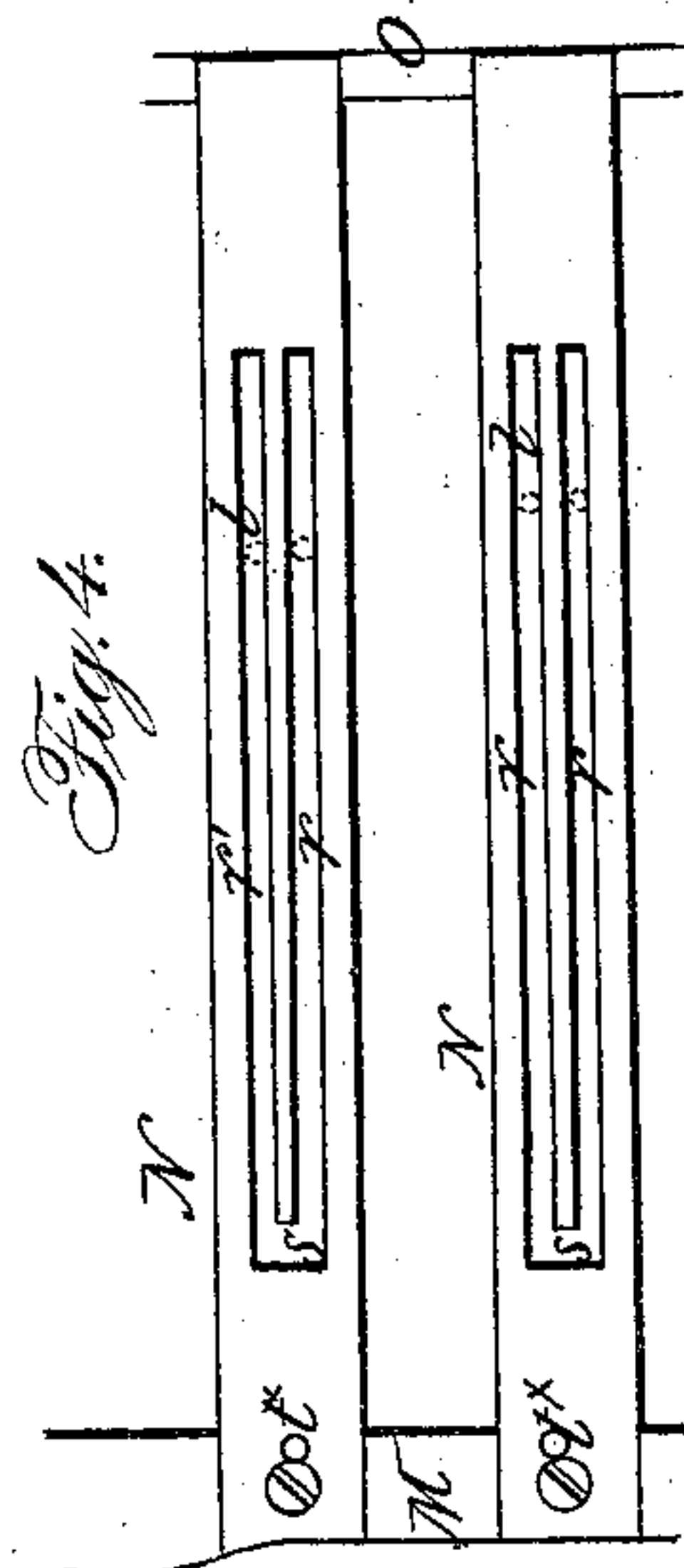
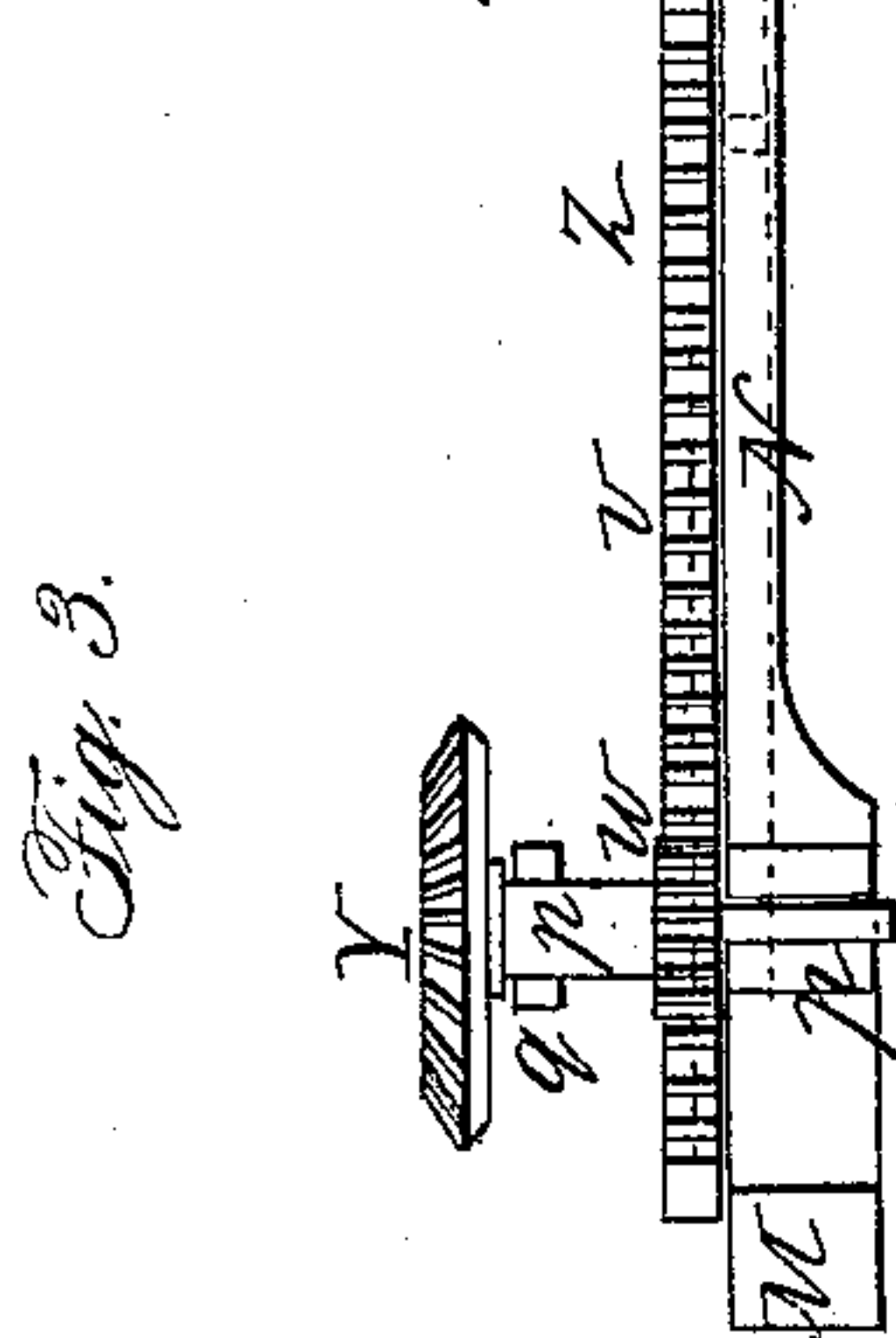
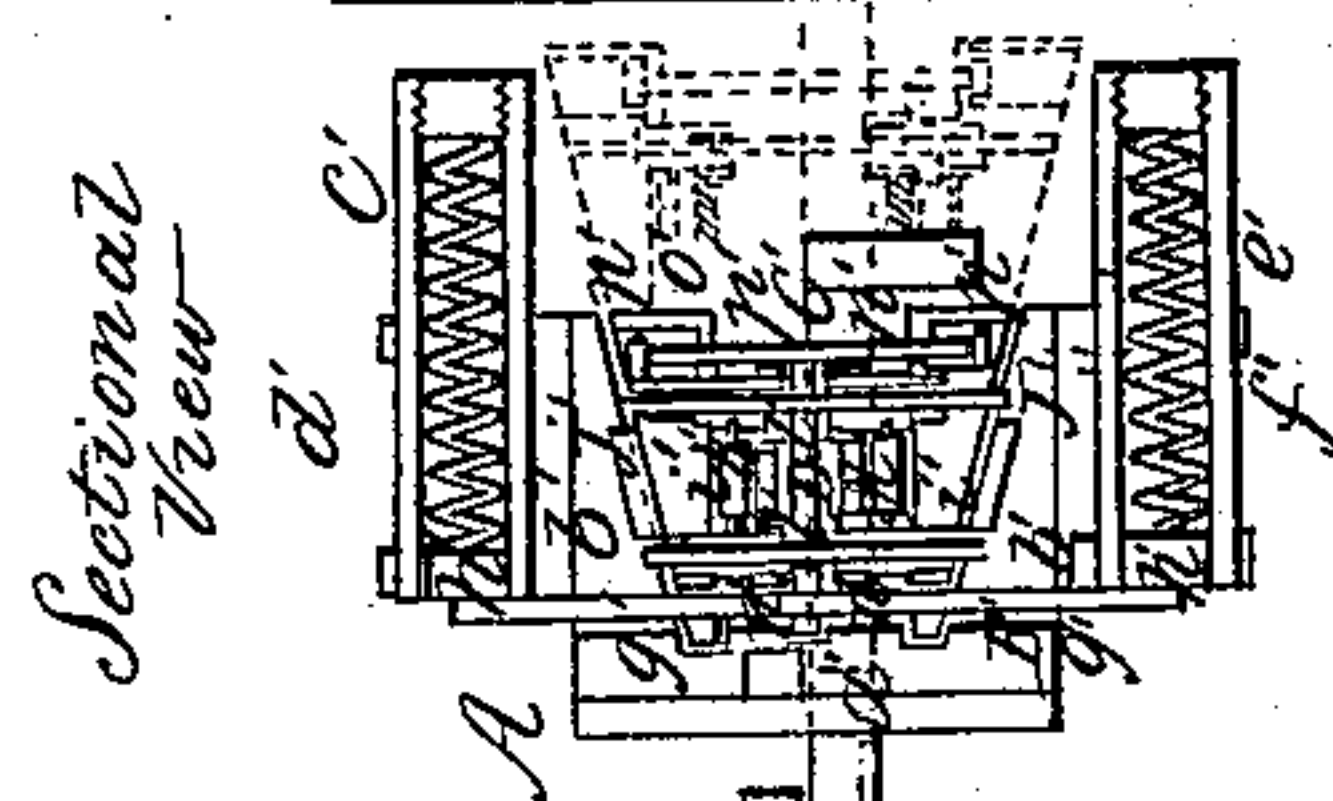
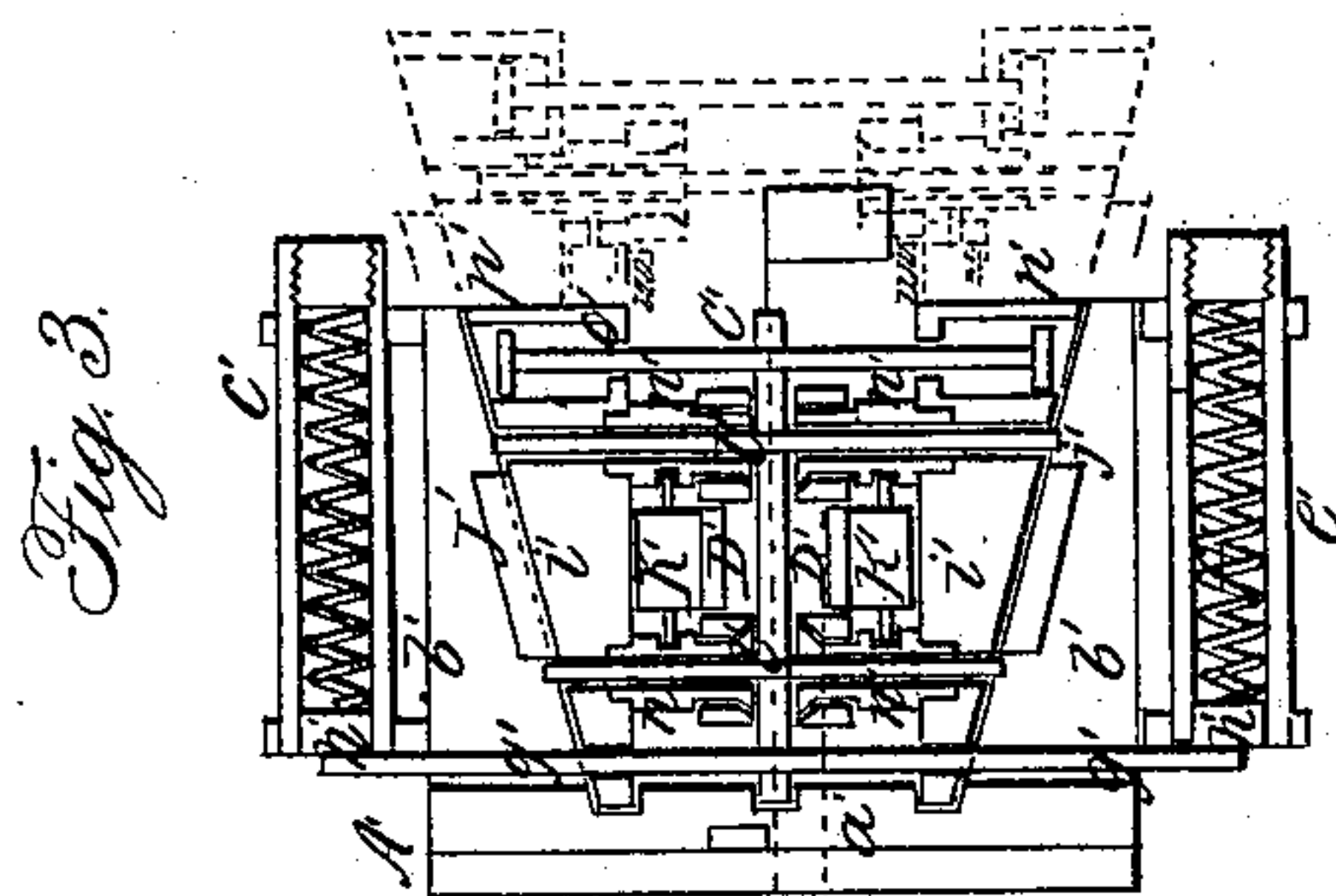
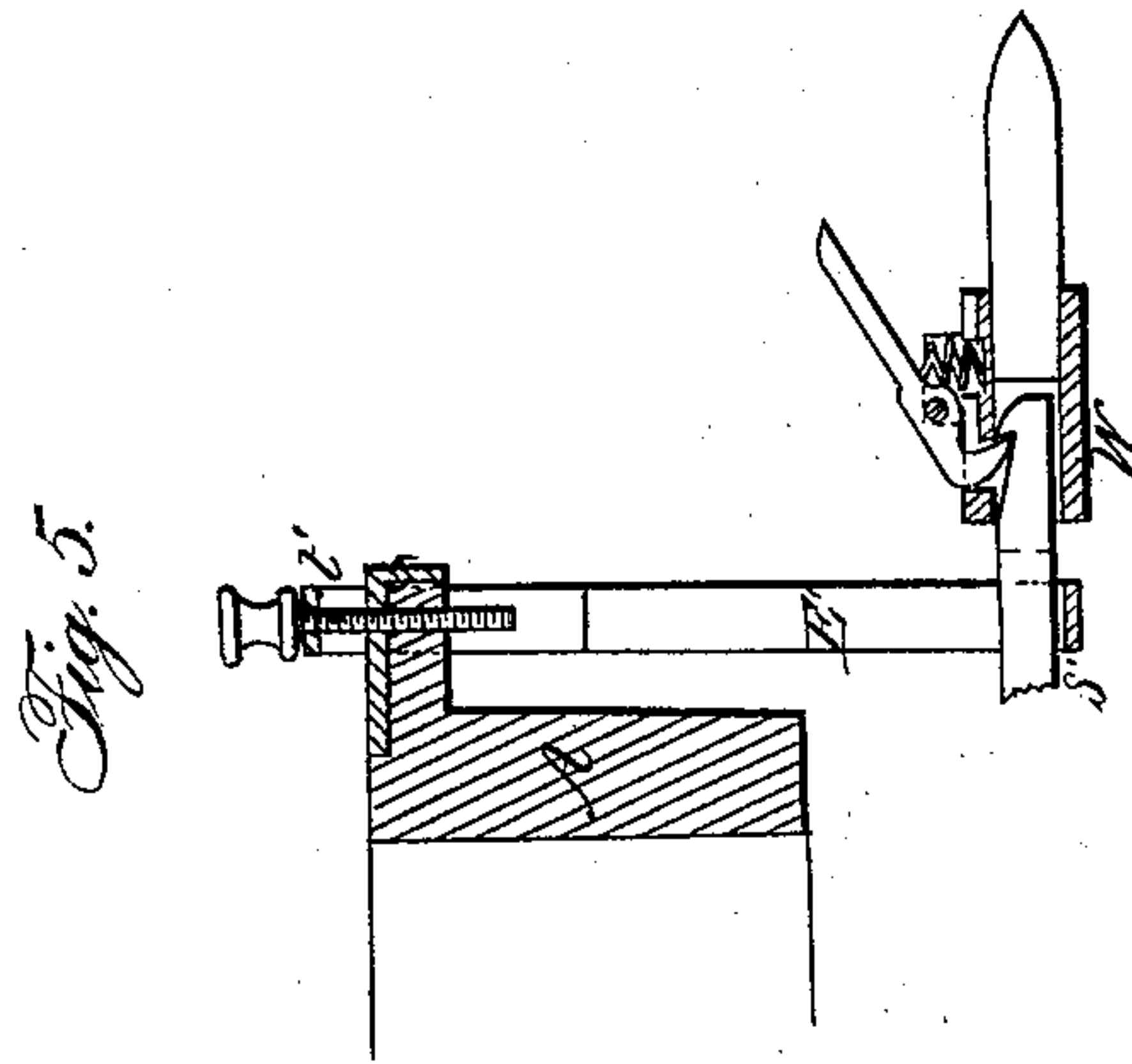
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2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

AUGUSTINE IREL AMBLER, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO HIMSELF AND R. N. AMBLER AND WARRICK MARTIN, OF SAME PLACE.

IMPROVED BRAKE FOR RAILROAD-CARS.

Specification forming part of Letters Patent No. 34,855, dated April 1, 1862.

To all whom it may concern:

Be it known that I, AUGUSTINE IREL AMBLER, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and Improved Brake for Railroad-Cars; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a side sectional view of my invention, taken in the line *x x*, Fig. 2. Fig. 2 is a plan or top view of the same. Fig. 3 is a section of a portion of the same, taken in the line *y y*, Fig. 2. Fig. 3^x is an enlarged portion of Fig. 3. Fig. 4 is a detached plan or top view of a portion of the same. Fig. 5 is a detached section of the same, taken in the line *z z*, Fig. 2.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to an improved brake for railroad-cars, and of that class which are operated by the movement of the cars from the running-gear thereof.

The object of the invention is to obtain a brake which will admit of being applied by a single person to all of a series or train of cars, the brakes of the several cars being simultaneously applied and with a uniform pressure and the pressure graduated, as may be required, with the greatest facility, far more so than the brake of a single car arranged in the ordinary way.

The invention consists in the employment or use of what I term a "tumbling-rod," which is placed longitudinally underneath each car just above its axles, the tumbling-rods of the several cars comprising a train being connected together and so arranged that they, with their draw-bars, may be rotated and also lowered and raised and by means of suitable gearing connected with a slide and belt-shipper, the above parts being used in connection with two cones, a belt, and two cylinders, one cone and cylinder being placed on an axle of each car and the other cone and cylinder on a lever, which is connected to a chain attached to the brake-bars, all being arranged substantially as hereinafter shown and described to effect the desired end.

To enable those skilled in the art to fully

understand and construct my invention, I will proceed to describe it.

A represents the bed or lower part of a car-frame, B the wheels, and C the axles, the journals of which have their bearings in pendent plates D, attached to the bed A.

E E' represent the brake-bars, which are suspended by springs F from the bed A. These brake-bars have a shoe G at each end, which may be constructed of any suitable material and so attached to the brake-bars that they may be readily removed when worn by use and replaced by new ones. The springs F, when not acted upon by any extraneous power, keep the shoes G free from the treads of the wheels B.

The innermost brake-bars, which are designated by E', have each a rod H attached to them at their centers, and to the outer ends of the rods H chains I I' are attached, one to each. These chains pass over pulleys J J, which are connected to the centers of the outermost brake-bars, which are designated by E. The chain I has one end of a rod K connected to it, and the opposite end of this rod is connected to the chain I', which passes around two pulleys *a a* on a lever L, the fulcrum-pin *b* of which passes through a bar M, fitted loosely on two of the axles C C of the car. (See Fig. 2.)

The bar M has two parallel bars N N attached to it at right angles, and the outer ends of the bars N N are attached at right angles to a bar O, which is fitted loosely on the same axles C C as the bar M and parallel with it. The bar O is connected with one side of the bed A of the car by a rod *c*. The bars M O do not interfere in the least with the rotation of the axles C C, on which they are placed, as the axles are allowed to turn freely in said bars.

The rods H H, chains I I', and rod K connect the brake-bars E E E' E' together, and also connect the brake-bars with the lever L, as will be fully understood by referring to Fig. 2. The lever L has its outer end resting on the bar O, the outer end of said lever being allowed to work or move freely on the bar, the portion on which the lever works or moves being of segment form, as shown at *d*, Fig. 2.

On the lever L there is placed loosely a cone P, and a short cylinder or cone Q is also

placed loosely on the lever L, the cylinder or cone Q being at the inner and smaller end of cone P, but not connected with it. If Q be a cylinder, it is equal in diameter to the smaller and inner end of the cone P; but if it be a frustum of a cone its larger end is equal in diameter to the inner and smaller end of P, and has the continuation of the bevel or taper of P, as shown in Fig. 2.

On the inner axle C, nearest the lever L, there is permanently attached a cone R, which is precisely similar to the cone P. The cone R, being permanently attached to the axle, of course rotates with it at all times. On this same axle C there is placed loosely a cylinder S, which is at the inner and smaller end of the cone R and is equal in diameter to the smaller and inner end of said cone. The cylinder S is provided at its outer end with teeth *e*, which, when the cylinder S is shoved in contact with the cone R, engage with teeth *f* at the inner end of said cone, the ratchet-teeth forming a clutch to connect the cylinder and cone together. The inner end of the cylinder S is provided with teeth *g*, and these teeth, when the cylinder S is shoved inward on its axle, engage with teeth *h*, which are on a fixed upright T, through which the axle C of cone R passes loosely. When the teeth *g* of the cylinder S are engaged with the teeth *h* of upright T, the cylinder S is held stationary, so that it cannot rotate with its axle C.

U is a small spiral spring which is placed on said axle C between the inner end of the cylinder S and the upright T, and this spring has a tendency to keep the cylinder S connected with the cone R. (See Fig. 2.)

V represents a rod or shaft which is suspended in bearings *i*, attached to the bed A. This rod V, I term a "tumbling-rod," and it is allowed to turn freely in its bearings, and has draw-heads W at its ends. Any form of coupling may be used for connecting the draw-heads of several cars together, provided the coupling will admit of being notched with the tumbling-rods.

On the tumbling-rod V, near one end of it, there is placed a bevel-wheel *i'*, which gears into a pinion *j* on an upright shaft *k*, having on its upper end a toothed wheel *l*, into which a wheel *m* gears, the wheel *m* being on a shaft *n*, which has a hand-wheel *o* on its upper end. (See more particularly Fig. 1.)

The tumbling-rod V, it will be seen, may be turned at any time by turning the hand-wheel *o*, which is at the end of the car and just above its platform.

On the tumbling-rod V there is also placed a bevel-pinion X, which gears into a horizontal bevel-wheel Y, said wheel being on a small vertical shaft *p*, the bearings *q* of which are connected with the parallel bars N N. (See Figs. 1 and 3.) The parallel bars N N are each provided with two parallel grooves *r r'* in their upper surfaces, and the grooves of each bar communicate with each other at their inner ends, as shown clearly at *s* in Fig.

4. On the parallel bars N N there is placed a slide Z, which is provided with pendent pins *t*, said pins fitting in the grooves *r r'*. These pins are so attached to the slide Z that one will fit in each groove *r*, and the pins are allowed to pass from the grooves *r* into the adjoining ones *r'* by passing through the lateral spaces *s* at the inner ends of the grooves. This movement of the pins is effected when the slide Z reaches the termination of its inward movement, at which point the pins *t* reach the spaces or passages *s*. Grooves *r^x*, similar to *r r'*, are also made in the under side of the slide Z, in which pins *t^x*, attached to the bars N N, fit. (See Fig. 1.)

The slide Z has a longitudinal central slot *u* made in it, and this slot is provided with teeth *v* at each side and at its upper end, as shown in Fig. 2. On the lower part of the shaft *p* of the bevel-wheel Y there is placed a pinion *w*, which is a trifle less in diameter than the width of the slot *u*. This pinion *w* gears into the teeth *v* of the slot *u*, and by turning the tumbling-rod V the slide Z, it will be seen, may be moved back and forth on the bars N N, the slide being allowed to make an entire movement back and forth by a continuous rotation of the tumbling-rod V in one and the same direction, in consequence of the lateral adjusting movement of the slide Z, produced by the pins *t* of the slide passing through the spaces *s* at the inner ends of the slots *r r'*, and thereby admitting of the pinion *w* passing from the teeth *v* at one side of the slot to those at its opposite side, the pins *t'* on the bars N N operating at the same time as guides in the grooves *r^x r^x* of the slide Z. The object of these bars being double in this arrangement is to adapt themselves to a car which may be brought into the train with the end reversed, which otherwise could not be acted upon by its brake in the train without turning round the car. The movement of the tumbling-rod in either direction will admit of the brake of each car being applied, while if the end of one should be reversed the pinion *w* between the bars and in the slot would gear into the side of the bars or slot upon the opposite side to the others, while the operation would be the same.

To the outer end of the slide Z there is attached a belt-shipper A', which is constructed in a novel way, as follows: An upright bar *a'* is connected centrally to the outer end of the slide, and to the upper and lower ends of said bar there are horizontal bars *b' b'*, the inner surfaces of which are beveled or inclined, so that the arms gradually diminish in thickness from their inner ends outward, as shown clearly in Fig. 3. To the upper surface of the upper arm *b'* there is attached a cylinder *c'*, which contains a spiral spring *d'*, and a similar cylinder *e'*, also having a spiral spring *f'* within it. B' is a vertical bar which passes through oblong slots *g'* in the arms *b' b'*, and the ends of the bar B' are provided with plungers *h'*, which fit in the cylinders *e' e'*, and

against which the springs $a' f'$ bear. The vertical bar B' also passes through slides $i' i'$, which are beveled or inclined at their outer surfaces and bear against the inner beveled or inclined surfaces of the arms $b' b'$. The outer surfaces of the slides $i' i'$ are provided with lips or projections j' , which fit in the slots g' of the arms b' and serve as guides for said slides. The inner surfaces of the slides $i' i'$ are parallel with each other, and to each of said surfaces there is attached a roller k' , the two rollers being parallel with each other, as shown in Fig. 3.

C' is a horizontal plate which is placed between the two slides $i' i'$, and is permanently attached to vertical rods l' , the ends of which are fitted loosely in the slides $i' i'$. The outer end of the plate C' is attached to the vertical bar B' , as shown at m' in Fig. 3, and on the rods l' there are placed rollers n' . A vertical rod o' also passes through the inner end of plate C' , and the ends of the rod o' are fitted in the slides i' , the ends of the rod o' being provided with a head or stop p' at each end. (Also shown.)

D' is a belt which may be constructed of any suitable material. A flat chain covered with leather or india-rubber would probably form a very desirable belt. This belt passes around the cylinder or cone Q and the cylinder S , and through the belt-shipper, over and under the plate C' thereof, and between the horizontal and vertical rollers $k' k' n' n'$, as shown in Figs. 3 & 3^x.

The draw-heads W of the tumbling-rod V are connected to the tumbling-rod by universal joints q' , as shown in Fig. 1, and the draw-heads are each supported by a bearing s' , which is placed in the lower end of a yoke E' . The yokes E' pass through the ends of the bed A of the car and are raised and lowered by means of a screw t' . (See Figs. 1 and 5.) By this arrangement the draw-heads may be adjusted vertically to suit cars of different heights. The bearings i are also attached to screws i^x , which pass one through a nut j^x on the bed A of the car and the other through a female screw or nut in the bar M , whereby the tumbling-rod may be elevated when desired and the wheel i' thrown out of gear with the wheel j , and the hand-wheel o thereby disconnected from the tumbling-rod. This adjustment of the tumbling-rod is preferable or necessary when the brakes are to be operated by the engineer or by a person on the engine or tender.

The operation is as follows: When the brake is not applied to the wheels B of the car, the chains $I I'$ are loose, the lever L being out from the cone R or having an oblique position with it, as shown in red in Fig. 2, and the belt D' is on the cylinder S and cylinder or cone Q , as shown in blue outline. When the car is in motion, the cone R is rotating, but the belt D' is stationary, as the cylinder S is not connected with cone R , the belt-shipper A' being at the termination of its inward movement,

as shown in red outline, Fig. 2. The chains $I I'$ being slack, the springs F keep the shoes G free or out from the wheels B . At any time when it is necessary to apply the brake the brakeman turns the hand-wheel o , and the tumbling-rod V is turned through the medium of the gearing $i' j' l m$, previously described, and the pinion w on the shaft p is turned through the medium of the gearing $X Y$. The pinion w , in consequence of meshing into the teeth v of the slide Z , will move said slide outward with the belt-shipper A' , and the latter by said movement will cast the belt D' on the cones $R P$, the belt rotating as it is shoved outward on the cones. This outward movement of the belt D' on the cones P causes the cone P on the lever L to be drawn toward the cone R on the axle C , and the lever L being thereby moved, the chain I' will be actuated and the brake-bars $E E'$ drawn toward their respective wheels B . The belt-shipper A' may be stopped at any desired point, and the belt D' consequently may be retained at any point on the cones $P R$, and the pressure of the shoes G on the treads of the wheels B regulated as occasion may require. When the whole pressure is required that can be given by the movement of the cars, the belt is at the outer and larger ends of the cones $P R$, as shown in Fig. 2. When it is desired to relieve the wheels of the brakes, the operator turns the tumbling-rod V in a reverse direction to that in which it was previously turned, and the belt-shipper A' and slide Z will consequently be moved inward. At the commencement of this inward movement of the belt-shipper A' its slides $i' i'$, owing to the resistance offered by the belt D' , will be shoved outward or, rather, allow the other parts of the belt-shipper to move with the slide Z , the springs $d f$ yielding or giving to admit of this result. This shifting of the relative position of the slides $i' i'$ with the other parts of the belt-shipper admits of the rollers $k' k'$ expanding, and the belt D' is consequently loosened or released. This will be fully understood by referring to Fig. 3, in which the outward position of the slides $i' i'$ is shown in red. This loosening or relaxing of the belt D' is very important, as it admits of the very ready backward movement of the belt D' on the cones $P R$, a result which would not otherwise be obtained in consequence of the belt D' being quite tight on the cones. At the termination of the inward movement of the belt-shipper A' the belt D' is drawn on the cylinder or cone Q and the cylinder S , the latter being brought in contact with the upright T , so that the teeth g of the former will engage with the teeth h of the latter and the cylinder S held stationary or prevented from rotating.

When several cars are connected together, forming a train, the hand-wheel o of any one of them may be actuated and the brakes of all the cars simultaneously applied, as the tumbling-rods V of the several cars are all connected together, and, if desired, the tumbling-

rod V of the first car may be operated by the engineer, the tumbling-rods being disconnected from the hand-wheels *o*. Various plans may be devised for applying power to the tumbling-rods, and I do not confine myself to any particular plan. Thus it will be seen that by means of simply turning the tumbling-rods, which may be done with the greatest facility, as but little power is required to effect such result, all the brakes of a series or train of cars may be applied simultaneously and the pressure of the shoes G on the wheels graduated, as desired, from a single pound up to the whole power, which is equal to the draft movement of the cars.

I would remark that, if necessary or desired, two pairs of cones P R may be applied to each car; but as they would be arranged substantially in the same manner as the single pair herein described a particular description of them would be unnecessary. I would also remark that the tumbling-rod may run beneath the axles by placing the beveled cog-wheel Y below the slot-bars, and turned downward, so as to gear with the beveled cog-wheel or pinion X upon the tumbling-rod. This, by always placing the bearings or journals for the tumbling-rod to pass through at a uniform distance from the top of the rails of the road, will make the raising or lowering of the tumbling-rod unnecessary to adapt itself to the different heights of cars, the tumbling-rod thus being always uniform in height from the rails.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The tumbling-rod V, in connection with the belt-shipper A' and slide Z, for the purpose of operating the belt D' on the cones P R, cylinder S, and cylinder or cone Q, all arranged substantially as and for the purpose herein set forth.

2. The employment or use, in connection with the belt D', of the two cones P R, one P being placed loosely on the lever L and the other R permanently attached to its axle C, for the purpose of actuating the lever L and operating upon the chain I', as and for the purpose specified.

3. The cylinder S, placed loosely on its axle C, and the cylinder or cone Q, placed loosely on the lever L, when used in connection with the cones P R, belt D', and belt-shipper A', and all arranged as and for the purpose set forth.

4. Constructing the belt-shipper A' with slides *i' i'*, having rollers *k' k' n' n'*, attached and acted upon by springs *d' f'*, and arranged, substantially as shown, for the purpose of loosening or relaxing the belt D' on its return or inward movement on the cones P R, as set forth.

5. The tumbling-rod V, slide Z, provided with the double rack formed of the slot *u* and teeth *v* and fitted on the double-grooved bars N N, as shown, in combination with the belt-shipper A', cones P R, cylinder S, cylinder or cone Q, and lever L, connected with the chain I' by means of the pulleys *a a* and the chain I', connected with the brake-bars E E E' E' by means of the rods H H K, chain I, and pulleys J J, all arranged for joint operation substantially as and for the purpose specified.

6. Suspending the tumbling-rod V underneath the bed A of the car in adjustable bearings *i*, for the purpose of disengaging, when desired, the tumbling-rod from the hand-wheel *o*.

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