2 Sheets—Sheet 1.

J. BUCK.

Car Brake.

No. 15,833. Patented Sept. 30, 1856.

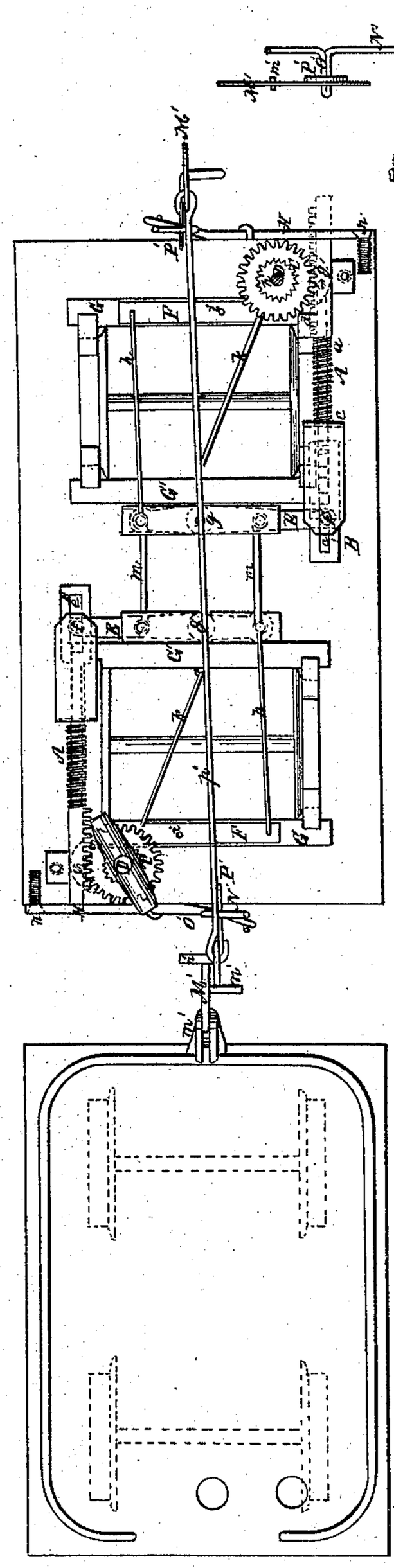

Fig. 1.

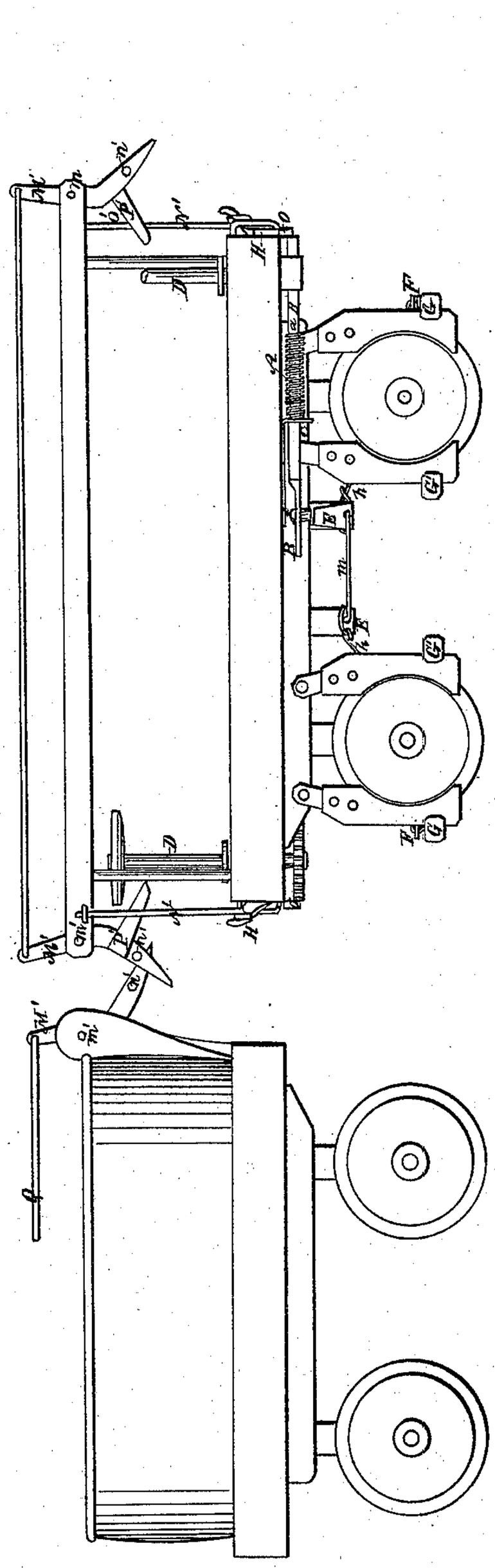

Fig. 2.

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Fig. 4.

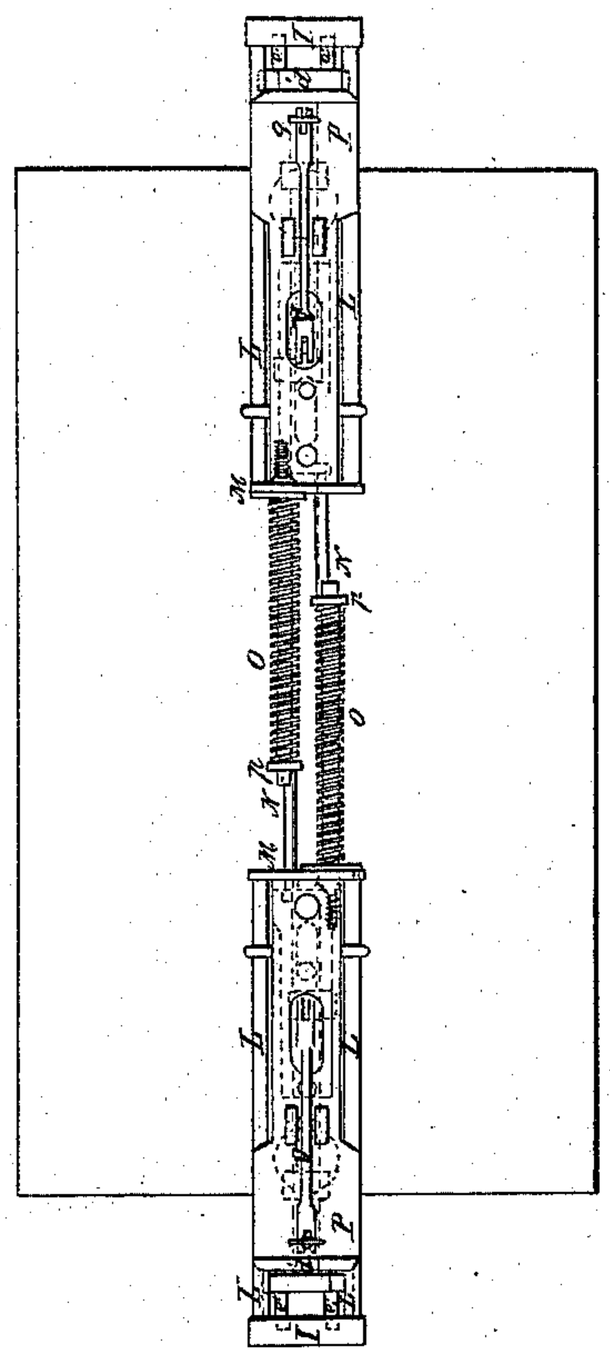


Fig. 5.

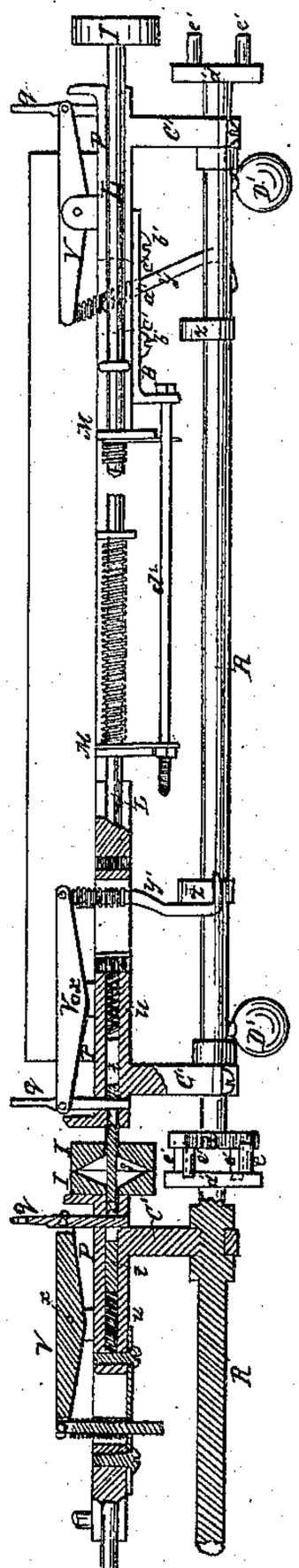


Fig. 6.

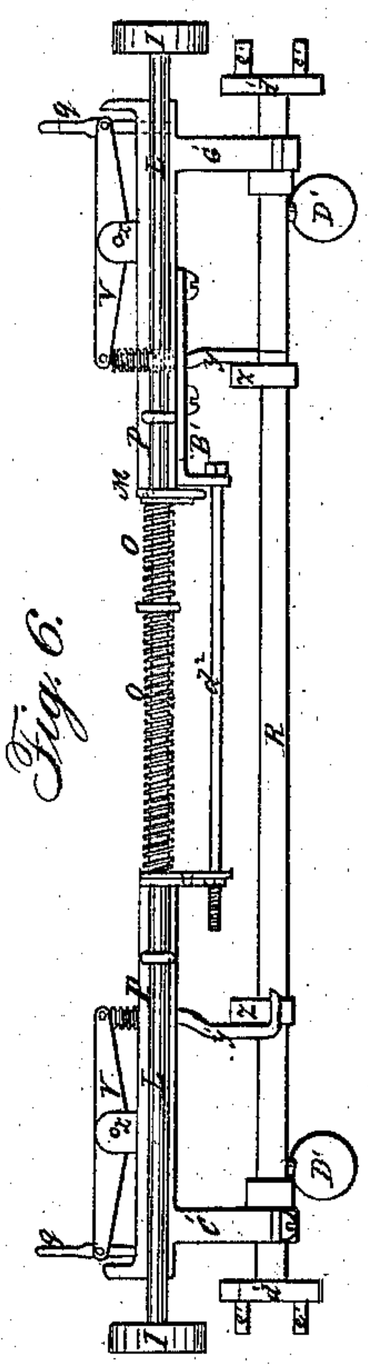


Fig. 11.

Fig. 10.

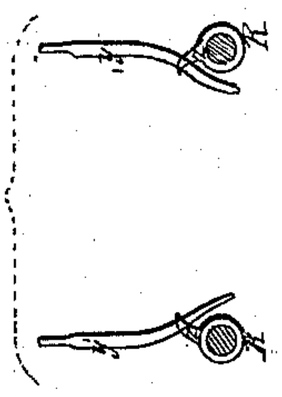


Fig. 12.

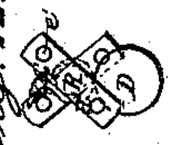


Fig. 9.

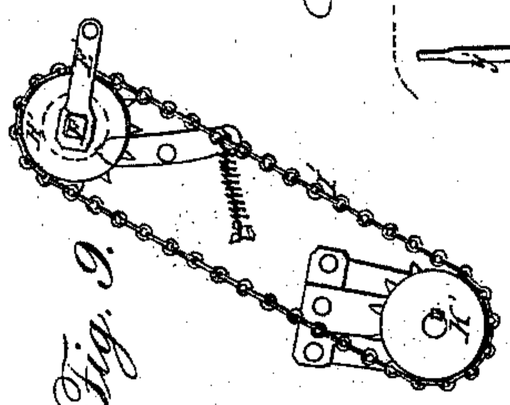


Fig. 8.

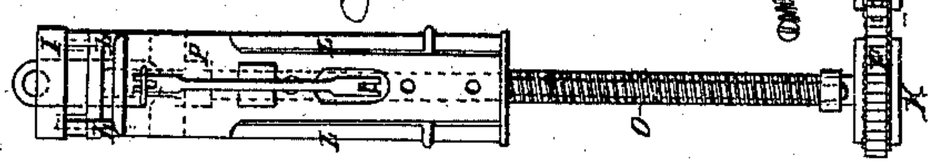
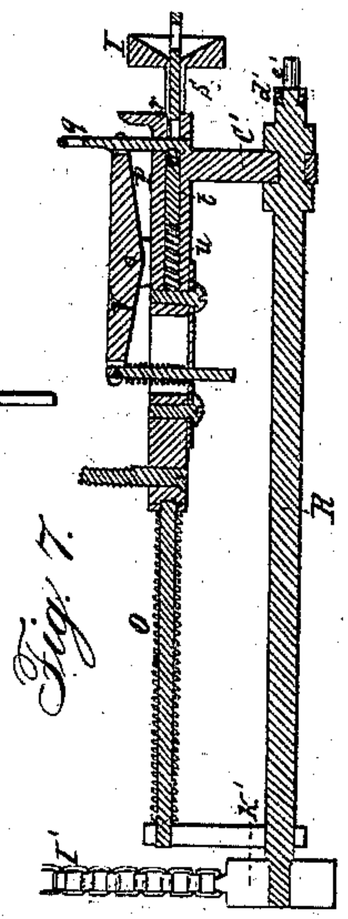


Fig. 7.



UNITED STATES PATENT OFFICE.

JOAB BUCK, OF FITCHBURG, MASSACHUSETTS, ASSIGNOR TO JOAB BUCK, H. S. BUCK, J. W. KIMBALL, AND D. H. THOMPSON.

DISCONNECTING RAILROAD-CARS AND APPLYING BRAKES.

Specification of Letters Patent No. 15,833, dated September 30, 1856.

To all whom it may concern:

Be it known that I, JOAB BUCK, of Fitchburg, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Railroad-Car Brakes, of which the following is a full, clear, and exact description, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a plan, the body of the car and certain portions of the apparatus being removed to show the parts which actuate the brakes; Fig. 2, an elevation of the same; Fig. 3, an end view of the platform of the car with details which will be referred to hereafter; Fig. 4, a plan, the body of the car and the mechanism which actuates the brakes being removed to show the buffers and the parts immediately connected therewith; Fig. 5, a side view of the same, showing upon the left in section the method by which the tender and cars are coupled together; the longitudinal shaft by which the cars are unshackled and the brakes applied by the engineer, being represented in red; Fig. 6, a side view of certain portions of the above detached; Fig. 7, a section of the apparatus attached to the tender, showing the manner in which the power is applied to the longitudinal shaft R, for the purpose of detaching the cars and applying the brakes; Fig. 8, a plan of the same, including also the crank and chain for setting the shaft in motion; Fig. 9, an end view of the same; Figs. 10, 11, and 12, details which will be referred to hereafter.

The nature of my invention consists in a peculiar mechanism for the operation of the brakes of a rail road car in combination with a mechanism for coupling and uncoupling the cars whereby the brakes may at any time be applied in either one of the three following manners: 1st. They may be operated by hand as at present the ordinary brake is applied, a greater or less force being employed as in the judgment of the brakeman may be required. 2d. All the brakes of all the cars may be instantaneously applied by the engineer. 3d. The engineer may at any time detach the last car of the train and apply the brakes of this car alone, after it has been so detached, the rods or shafts by which the engineer is enabled to operate the coupling pins and brakes of the whole train being so arranged that they shall be connected by the action of bringing the cars together, and disconnected when the cars are again separated, without the attention or care of the attendants being required to attach or detach the connections as has heretofore been the case.

To enable others skilled in the art to understand and apply my invention I will proceed to describe the method which I have adopted of carrying it out.

The brakes are applied by the force of springs which being wound up are retained in readiness to act while the train is in motion. The means by which this is accomplished will now be described.

A, Figs. 1 and 2, is a spring which is coiled around the sliding bar B, one end of the spring bearing against a shoulder *a* upon this bar, the other end resting constantly in contact with the stationary stop *c* secured to the underneath part of the car—this bar is furnished at one end with cogs *d*, which engage with the teeth of a wheel C upon the bottom of the windlass shaft, which is placed in the ordinary position at the ends of the car—the other end of this bar has a slot *e* in which plays a pin *f*, which rises from a lever E as seen in Fig. 2. This lever is pivoted at the point *g* to the bottom of the car or to a suitable attachment thereto. The opposite end of this lever is connected by means of the rod *h* to a lever F, pivoted at *i* to one of the brake bars G—the other end of the lever F is connected by means of the rod *k* to the brake bar G′. There is a similar arrangement of levers and rods at each end of the car as seen in Fig. 1—the two levers E being connected by the rods *m*. It will thus appear that all the brakes of the train will be applied whenever either of the springs A is allowed to move the sliding bar B into the position seen in red in Fig. 1. The brakes are taken off to permit the motion of the car by means of the windlass D—by turning which the sliding bar B is thrown into the position seen in Fig. 2. This bar is retained in this position by the following means—H is a lever pivoted to the end of the car at *n*, and having a tooth *o* projecting down from its under side. When the sliding bar B is in the position seen in red in Fig. 1, the tooth *o* rests upon its upper surface. When however by the action of the windlass D the sliding bar is thrown into the position seen in Fig.

2 the lever H drops into the position seen in Figs. 2 and 3, the tooth *o* preventing the bar from being thrown out by the action of its spring A and the brakes remain off the wheels until the lever H is again raised.

The method by which the cars are coupled together in trains as also the connection between the coupling arrangement and the brakes will now be described.

I, Figs. 4, 5, and 6, is the buffer which is attached to the rods L, which slide in suitable supports beneath the bottom of the car—the rods are connected together at their inner extremity by the bar M, to which is attached the rod N which carries a spiral spring O, one end of which rests against a stationary bearing *p*, and the other against the bar M, by which means the buffer I when the cars are not shackled together is forced out into the position seen in Figs. 4, 6, and 7 and at the right hand end of Fig. 5. The rods L are supported and guided in their motions by a metallic attachment P secured to the underneath side of the car. In Fig. 5 is seen a section through this attachment, the adjacent ends of a car and the tender being shown as coupled together—*q* is the coupling pin—*s* the coupling link which after passing through the buffer I enters a slot *r* made to receive it in the stationary attachment P—*t* is a block which slides within this slot and is forced outward by the spring *u* behind it. When the coupling pin *q* is withdrawn the block *t* is forced beneath it, and the pin is prevented from descending. When the link *s* is forced in it presses the block *t* back and the coupling pin is allowed to enter the eye of the link as seen in section in Figs. 5 and 7. The pin *q* is pivoted to the lever V which vibrates around the point *x*,—from the other end of this lever is suspended the hook *y*, which is surrounded by a coiled spring, the tendency of which is to hold the coupling pin constantly in place in the eye of the link,—this hook passes through a hole *a'* (Fig. 11) in a sliding plate B'—this plate is loosely secured to the bottom of the metallic attachment P by means of the screws *b'* in the slots *c'* and is connected by means of the rod d^2 to the plate M and buffer rods L at the other end of the car in such a manner that when the buffer is forced in, as seen at the left hand in Fig. 5, the hook *y* at the other end of the car is thrown into the inclined position seen at the right hand of Fig. 5. Whenever the cars are unshackled and the buffers are forced out by the action of their springs O, the sliding plate B' is thrown into such a position as to cause the hooks *y* to hang vertically as seen in Fig. 6 and at *y'* in Fig. 5.

It is evident from the above that where a number of cars having the above described machinery attached to them, are coupled together in a train all the hooks *y* will be thrown into an inclined position out of the reach of the dogs *z* upon the shaft R, as will be hereafter explained, except the one connected with the buffer at the rear end of the last car,—this hook will hang vertically as seen at *y'* Fig. 5. The object of this arrangement will now be explained.

R is a shaft running lengthwise beneath each of the cars—it is carried by bearings C' which project downward from the attachment P, this shaft carries at each end a bar or clutch arm *d'*, from which project two pins *e'*—it is balanced in such a position by the weights D' that the arms *d'* shall always be inclined at an angle of 45° to the horizon and at opposite inclinations from the vertical so that in whatever manner the ends of two cars may be brought together the adjacent arms *d'* will be at right angles to each other, and their pins *e'* will not interfere to prevent their locking. As seen in Fig. 12 the shafts R are of such a length that when the cars are coupled together the pins *e'* shall project past the arms *d'* of the adjacent car, and thus by turning the shaft of the foremost car or tender those attached to all the succeeding cars will be turned in the same direction.

z are dogs secured to the shafts R in such position that as the shafts are revolved the dogs shall depress the hooks *y* which are not thrown out of the perpendicular and withdraw the coupling pin connected with such hook.

It has already been shown that when the cars are coupled together in a train the only hook which is in a position to be operated upon by the dog *z* is that which is connected with the rear buffer of the last car *y'* (Fig. 5). On turning the shaft R this hook will be the only one that is operated upon;—by its depression the coupling pin is withdrawn and the last car of the train is separated from the others by the force of the spring O.

The shafts R are set in motion by the following means—E' is a crank upon the tender within reach of the engineer, upon the shaft F' of which is a toothed wheel H'. This wheel carries a chain I' which passes around another toothed wheel K' upon the shaft R. By operating this crank the engineer has it in his power to revolve the shafts R through the whole length of the train and thus detach the last car;—the rear buffer of the next car is then thrown out by its spring O—thereby bringing another of the hooks *y* into a position to be operated upon by its dogs *z*—and thus if the longitudinal shaft R be again revolved another car of the train will be detached and so on until all the cars are separated one by one.

It is evident that the longitudinal shaft thus constructed will form a continuous connection through the whole train, and that the different portions of which it is composed will not require to be connected together by joints or otherwise, the coupling of the cars bringing the parts into the required position to operate. Heretofore where such connections have been attempted through a train of cars each portion of the shaft required to be connected by a suitable joint to the adjacent portions, and the failure to connect any one of these joints rendered the whole apparatus inoperative.

It now remains to show the manner in which the brakes are applied to each car after it is detached from the train. It will be seen by an inspection of Fig. 3 that the lever H by the raising of which the brakes are thrown into operation, rests upon the top of the lever V which carries the coupling pin, consequently as the latter is raised for the purpose of uncoupling the rear car the lever H is raised and the brakes of this car are thus applied at the same instant. When it is desired to unshackle a car without applying its brakes, the windlass shaft D is prevented from revolving by the click g' which is made to engage with the ratchet wheel h'. When thus arranged the brakes may be applied as usual by hand, it being simply necessary to raise the lever H—and if a greater force be required than that of the springs A it may be applied by turning the shaft D in the direction contrary to that necessary to take off the brakes.

It now remains to be shown how the brakes of all the cars in the train may be applied simultaneously and instantaneously by the engineer without the necessity of connecting or disconnecting the rods by which the communication is made from one end of the train to the other.

M′ (Figs. 1 and 2) are bent levers pivoted to the roof of the car at m' and having pins n' near their lower extremities—the two levers at the extreme ends of each car are connected by a rod p'. When the cars are coupled together these levers are brought so near to each other that the extreme end of one of them by pressing upon the pin n' of the other lever communicates its motion thereto;—this motion is then communicated through the rod p' to the lever M′ at the other end of the car, and the motion is thus communicated from car to car through the whole train. This motion of the levers M′ is made available for the purpose of applying the brakes in the following manner—N′ (Figs. 1, 2, and 3) is an upright rod rising from the end of the lever H, and having an arm O′ projecting from one side of it,—P′ is an arm attached to the lever M′ in such position that as the latter is moved in the manner already described by a pull upon the rod Q′, the rods N′ and with them the levers H are raised by the arms P′, and thus the brakes of all the cars are simultaneously applied,—one only of the springs A upon each car being brought into use for the purpose. If the pull be made upon the rod which connects the levers M′ from the rear of the train they will be moved in the opposite direction and the other set of springs A will be brought into operation. The brakes of all the cars may thus be operated from either end of the train.

Objections have heretofore been made to the use of spring brakes on the ground that a spring that would apply the brakes of a loaded car without dragging the wheels, would drag the wheels of the same car when it was empty—and if the springs were graduated to apply the brakes of the empty car, it would not be sufficient for a full one. On this account as it soon destroys the wheels to "drag" them upon the rails, hand brakes have heretofore been preferred, notwithstanding the great superiority of the spring brake in time of danger. It will be perceived that by the above described arrangement this objection is entirely removed by the command which each brakeman has over the spring which applies the brakes of his own car;—this spring being applied immediately to the rigid connection B which communicates the power of the windlass to the brakes, by which means if the brakeman at any time finds that the springs are dragging his wheels he can by means of his windlass relieve the wheels of a portion of the force applied to them.

I do not claim the application of all the brakes by the engineer, nor do I claim the mere combination of a brake and coupling apparatus, as that is well known, but

What I do claim as my invention and desire to secure by Letters Patent is—

The within described combination and arrangement of the shaft R, dogs z, hooks y, and levers H and V, operating in the manner substantially as herein set forth for the purpose of uncoupling whichever car may be last in the train simultaneously with the application of its brakes as set forth.

JOAB BUCK.

Witnesses:
SAML. COOPER,
JOHN S. CLOW.