

No. 743,144.

PATENTED NOV. 3, 1903.

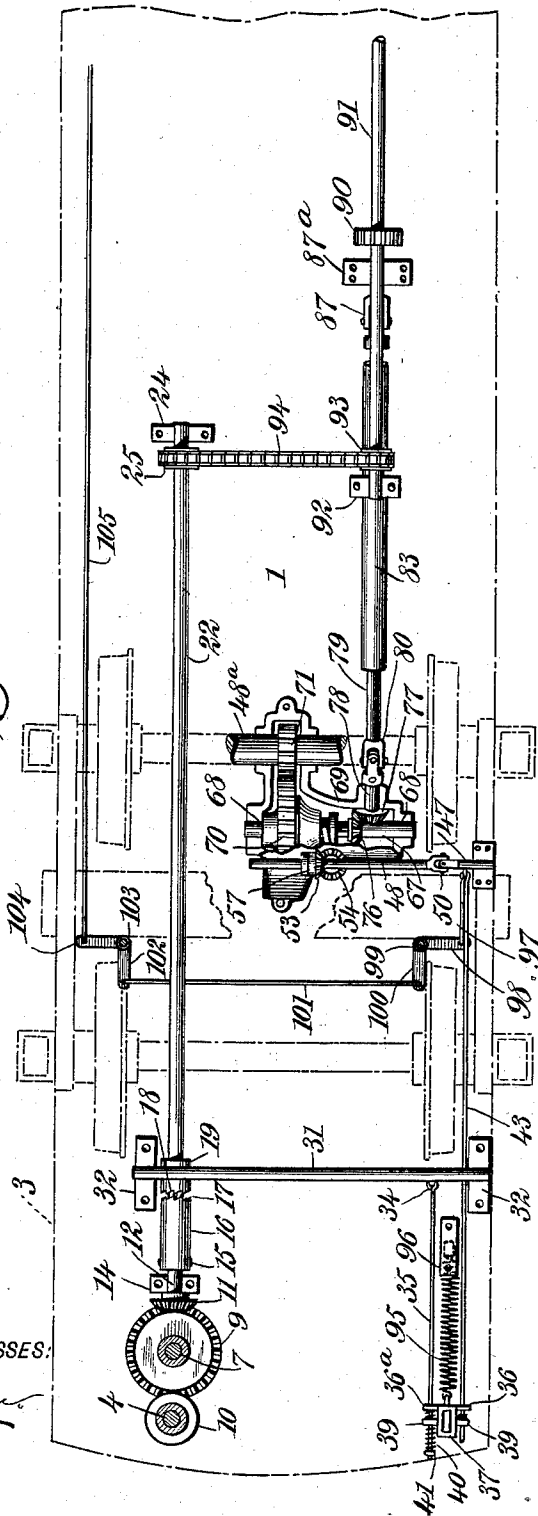
J. H. BRUCE.
BRAKE OPERATING MECHANISM FOR RAILWAY CARS.

APPLICATION FILED JUNE 29, 1903.

NO MODEL.

3 SHEETS—SHEET 1.

Fig. 1.



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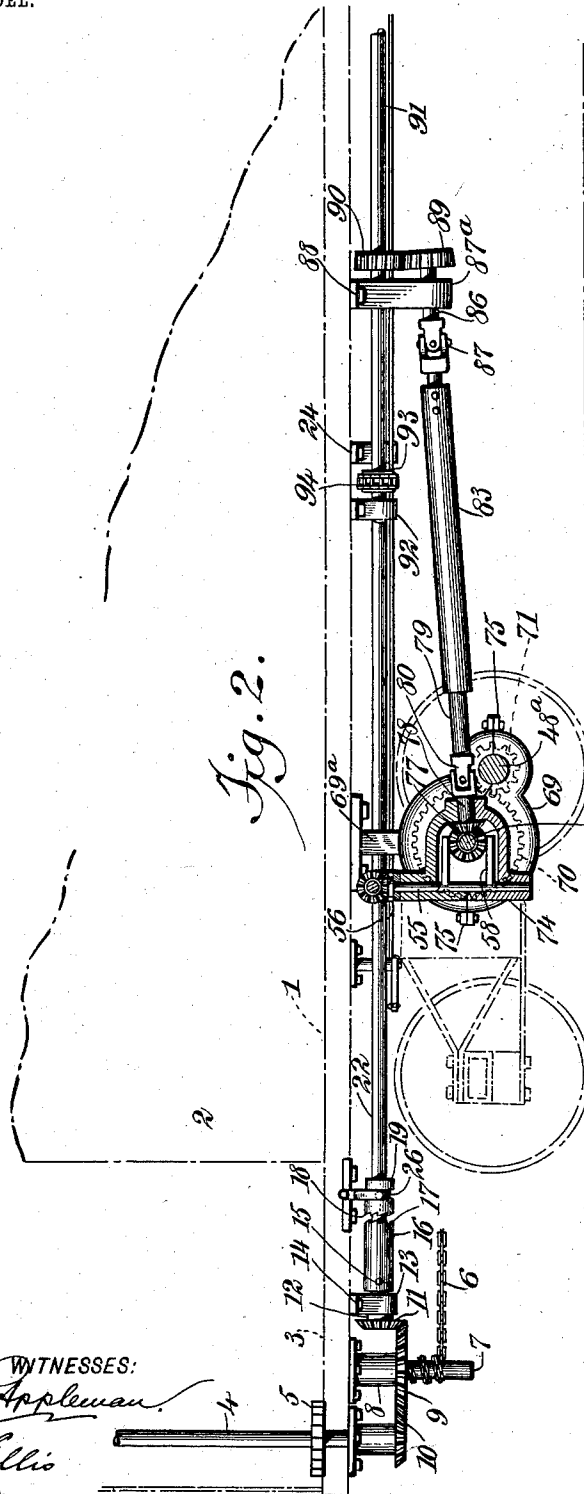


Fig. 2.

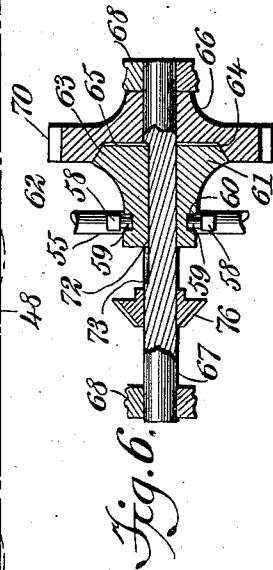


Fig. 6.

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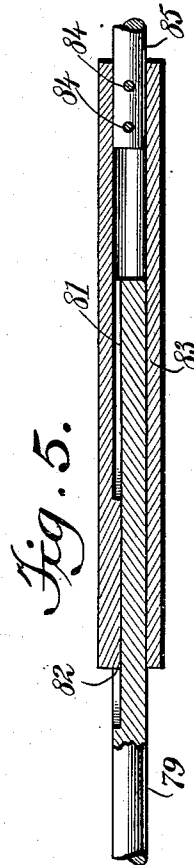
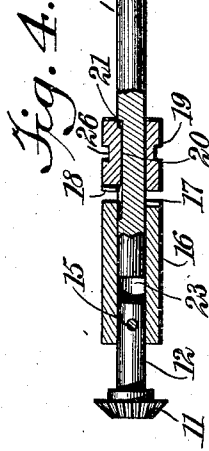
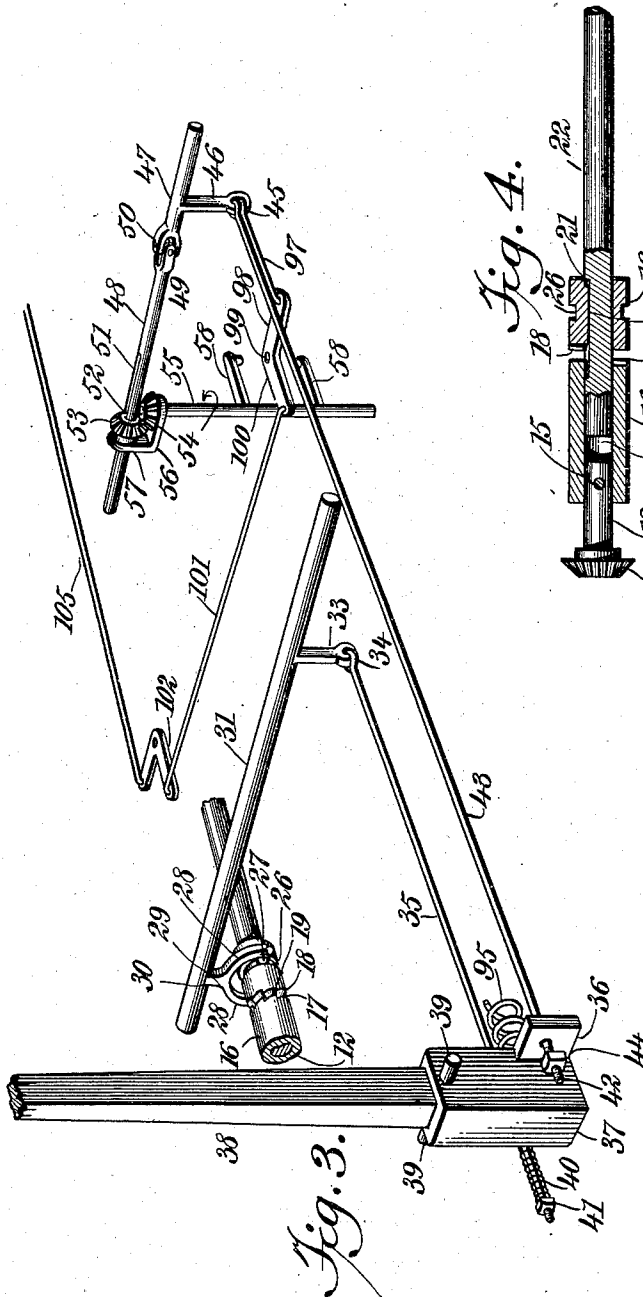
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3 SHEETS—SHEET 3.



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A. R. Appleman
E. E. Ellis

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UNITED STATES PATENT OFFICE.

JOHN H. BRUCE, OF PITTSBURG, PENNSYLVANIA.

BRAKE-OPERATING MECHANISM FOR RAILWAY-CARS.

SPECIFICATION forming part of Letters Patent No. 743,144, dated November 3, 1903.

Application filed June 29, 1903. Serial No. 163,495. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. BRUCE, a citizen of the United States, and a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and Improved Brake-Operating Mechanism for Railway-Cars, of which the following is a full, clear, and exact description.

This invention relates to brake-operating devices for railway-cars; and it consists, substantially, in the construction, organization, and combinations of parts hereinafter particularly described, and pointed out in the claims.

One of the principal objects of my invention is to provide means for overcoming numerous disadvantages and objections found to exist with many other devices hitherto devised for similar purposes and to provide devices of this kind which are effective and reliable in use, besides comprising few parts, not liable to get out of order, and which may be easily regulated and controlled.

A further object of the invention is to provide devices of the kind referred to which are simple in their organization and which also are comparatively inexpensive to manufacture and possess the capacity for long and repeated service.

The above and additional objects are attained by means substantially such as are illustrated in the accompanying drawings, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view, in part section, of brake devices or mechanism for railway-cars embodying my improvements, the bottom of the car and a set of wheels and axles therefor being shown in broken lines. Fig. 2 is a side view showing part of the body of the car and wheels therefor, also in dotted lines. Fig. 3 is a view in perspective, showing the general construction and organization of the principal parts or elements contributing to my improvements and from which the operation will be more fully understood. Figs. 4 and 5 are enlarged views in detail of certain parts, each view being partly in longitudinal section; and Fig. 6 is also an enlarged longitudinal sectional view of the two-part clutch and auxiliaries thereto by which power may be de-

rived from an axle of the car to actuate the devices for operating the brakes.

Before proceeding with a more detailed description it may be stated that in the form of my improvements herein shown I employ ordinary chains, which may be operated in the usual way to apply the brakes—that is, by means of a rotatable rod located at the platform of the car and being under the control of the operator—and in addition thereto I employ special mechanism by which the momentum of the car may be utilized as a source of power for operating the brakes directly from an axle of the car, such mechanism being capable of being thrown into and out of operation at will and being also under the control of the operator. I still further employ special mountings for and connections between certain of the elements or parts, by which accommodation is had to lateral or other swinging movements of the trucks of the car, and while I have herein illustrated my improvements in a certain preferred embodiment it will be understood, of course, that I am not limited to the precise details thereof in practice, since immaterial changes therein may be resorted to coming within the scope of my invention.

Specific reference being had to the drawings by the designating characters marked thereon, 1 represents the bottom of a railway-car, having beyond the body 2 thereof the usual platform 3, upon which the operator stands during the travel of the car, and mounted to turn in suitable bearings therefor at an appropriate part of said platform is the usual hand-operated rod 4, turning with which is a ratchet 5, which may be engaged in the usual way by a pawl (not shown) to hold the rod in any desired position to which it and the said ratchet may be turned for the purpose of causing one or more brake-shoes (not shown) to be carried into operative engagement with the car-wheels in the ordinary way, the movement of the brake-shoes being accomplished, as is apparent, by means of a chain 6, parts of which are caused to be wound about a vertical shaft 7, turning in suitable bearings 8 therefor on the under side of the platform, said shaft having thereon, preferably, a beveled gear-wheel 9, the teeth of which are en-

gaged by the teeth of a beveled pinion 10, carried at the lower end of said rod 4. The teeth of said beveled gear-wheel 9 are also engaged by the teeth of another beveled pinion 11, rigid with the forward end of a stub-shaft 12, (see Fig. 4,) supported to turn in a hanger or bearing 13, secured at 14 beneath said platform, said stub-shaft having secured thereto at 15 to turn therewith a member 16 of a two-part clutch, said member being hollow and formed or provided at the rearward end thereof with teeth 17, which are caused to be engaged by corresponding teeth 18, formed or provided on the forward end of a longitudinally-slidable clutch member 19, having a feather 20 working in a groove 21 formed in a shaft 22, the forward end of which extends for a suitable distance within the bore 23 of the clutch member 16 and the rearward end or part of which is rotatably supported in a bearing 24 therefor secured to the under side of the car-bottom 1, as shown, a sprocket-wheel 25 being rigid with this shaft at or near the said bearing. (See Fig. 1.)

The said slidable clutch member 19 is preferably formed with a circumferential groove 26, between the sides of which are fitted oppositely-disposed pins or projections 27, provided at the ends of the arms 28 of a yoke 29, rigid at 30 with a rock-shaft 31, supported transversely of the bottom of the car in suitable bearings 32 therefor secured to said bottom. This rock-shaft is provided near the other end thereof, or, say, a suitable distance from said yoke, with an arm 33, having therein an opening in which is received the hooked rearward end 34 of a longitudinal rod 35, the forward end portion of which passes through an opening in the inner one of duplicate lateral wings 36 36^a, integral with the opposite sides of the lower or shorter socketed arm 37 of an operating controller-lever 38, having lateral trunnions 39, by which the lever is supported in suitable bearings to enable the same to be rocked or swung back and forth by the operator, attention being called to the fact that the said forward end portion of the said rod 35 is surrounded by a spring 40, having its bearings between a nut 41 on the end of the rod and the forward face of the said inner lateral wing 36. (See Fig. 1.)

The outer lateral wing 36 is provided with an opening through which passes the forward end portion 42 of a main operating-rod 43, the said end portion being provided with an adjusting-nut 44, normally located beyond the forward face of said wing 36, it being here mentioned that the movements imparted to the rods 35 and 43 from the lever 38 are independent of each other, the movement of the rod 35 taking place in advance of that of the rod 43, due to the fact that in carrying the lever 38 rearwardly the said rod 35 is immediately acted upon by reason of the direct and constant contact between the forward face of the wing 36^a and the rearward end of said spring 40, whereas the wing 36 has a limited

movement along the said forward end portion of the rod 43 before the latter is operated by engagement of the forward face of the wing 36 with the said nut 44. The said rod 43 is also of greater length than said rod 35, and the hooked rearward end 45 thereof is in movable connection with the lower end of an arm 46, pendent from the section 47 of a rock-shaft 49, located forwardly of the forward axle 48^a of the car, the adjacent ends of the sections 47 and 48 of said shaft being connected by a universal joint 50, (see Figs. 1 and 3,) the section 48 preferably having therein a longitudinal groove 51, in which fits a feather or key 52, integral with a beveled gear-wheel 53, the teeth of which engage with the teeth of a similar wheel 54, carried at the upper end of a vertical rotatable shaft 55, said shaft being also provided directly beneath the wheel 54 with a horizontal bracket 56, having a vertical member 57, in which a part of the said section 48 of the rock-shaft 49 has its bearing. (See Fig. 3.) The said bracket may preferably be mounted to have horizontal motion independently of any motion which may be imparted to the shaft 55, as presently explained, thus to enable the recently-recited elements to retain their proper operative relation and still permit conformability thereof to swinging movements of the trucks of the car in the travel of the latter. In this respect also the said universal joint 50 imparts material aid, as will be apparent. The said shaft 55 is provided with suitable parallel yoke arms 58, having pins or other devices 59, which work between the sides of a circumferential groove 60, formed in the movable or slidable member 61 of a friction-clutch, (designated as a whole at 62 in Fig. 6,) having the edge of the head thereof beveled at 63 for engagement with a correspondingly-beveled surface 64 of the sides of a recess 65 in the face of the stationary member 66 of said friction-clutch, the two said clutch members being supported by a short shaft 67, having its ends in bearings 68 at the end walls of a housing or casing 69 (suspended from the car-bottom 1 at 69^a) for this clutch and its auxiliaries and the said stationary member being formed with gear-teeth 70, which are engaged by the teeth of a gear-wheel 71, carried by the said car-axle 48^a, attention being called to the fact that the slidable clutch member 61 is provided with a feather 72, working in a groove 73 therefor in said shaft 67. The shaft 55 has its bearings or support in a suitable part of the housing or casing, as shown at 74 in Fig. 2, this structure preferably comprising two separable sections secured together in any suitable manner at 75.

The shaft 67 carries, preferably, a beveled gear-wheel 76, rigid therewith and the teeth of which engage the teeth of a similar gear-wheel 77, carried rigidly at the forward end of the short section 78 of a rotatable shaft 79, the rearward end of said section being connected to said shaft by means of a universal

joint 80, the shaft having a longitudinal groove 81 therein, (see Fig. 5,) in which fits a feather 82, formed interiorly of a sleeve 83, in which the said shaft is adapted to slide back and forth, as is apparent, also in conformity with horizontal swinging movements of the car-truck, the rearward end of said sleeve having secured therein at 84 a portion of a stub-shaft 85, which is connected to another stub-shaft 86 (see Fig. 2) by means of a universal joint 87, said stub-shaft 86 being supported by a bearing or hanger 87^a, secured at 88 to the under side of the bottom of the car and also carrying a beveled gear-wheel 89, the teeth of which engage the teeth of a gear-wheel 90, rigid with a rotatable rod 91, (shown broken off at one end in Fig. 1,) having its support in the bearing 87^a and in a bearing 92, also secured to the underside of the bottom of the car, as shown. Said shaft 91 is provided with a sprocket-wheel 93, connected to the hereinbefore-mentioned sprocket-wheel 25 on the rod 22 by means of a sprocket-chain 94, (see Figs. 1 and 2,) and attention is called to the fact that in virtue of the employment of each of the said universal joints 80 and 87 additional accommodation is afforded to all movements of the car-truck tending to disconnect the different coöperative elements illustrated and described.

The lower and shorter arm of the operating-lever 38 has connected thereto the forward end of a spring 95, the rearward end of which is secured at 96, (see Fig. 1,) this spring serving to restore all parts to their original positions on releasing said lever after the same has been drawn or pulled upon to cause the different elements to be carried into operative relation, all as will be readily understood. Also in movable connection with the end of the arm 46 on the section 47 of the shaft 49 is the rearward end of a short rod 97, the forward end of which is in similar connection with the arm 98 of a bell-crank lever pivoted at 99 and having the end of the other arm 100 thereof in movable connection with one end of a transverse rod 101, the other end of which is in similar connection with the corresponding arm 102 of an opposite bell-crank lever pivoted at 103 and having its remaining arm in movable connection at 104 with the forward end of a rod 105, which may be extended to the other end of the car and from which substantially the same operations may be performed through the medium of duplicated primary actuating devices to those already referred to, as is apparent.

To operate the mechanism, the lever 38 is drawn backwardly, and the rod 35 is immediately acted upon to rock the shaft 31, thereby carrying the slidable clutch member 19 into engagement with the member 16, and then the independent movement of the rod 43 takes place, as already explained, whereupon the shaft 50 is rocked or retarded sufficiently to cause the vertical shaft 55 to be rotated, and thus by means of the yoke-arms

58 the slidable member 61 of the friction-clutch 62 is moved into engagement with the stationary member 66 of such clutch and the said clutch, together with the shaft 67, are rotated, this motion being communicated to the shaft 91, thence to the shaft 22 via the intermediate connections described, it being evident that in this way the shaft 7 will be operated to take up the brake-chain 6. As before stated, I am not limited to the specific details of construction and organization herein referred to, and it may be here added that, as shown, the lower or shorter arm of the lever 38 is practically constituted of a socket from which the lever is removable to be taken to the opposite end of the car to be applied and operated in like manner, all as will be fully understood.

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

1. In operating mechanism for car-brakes, the combination with a brake-chain and means for winding up the same, of a longitudinal shaft geared to said means, stationary and slidable clutch members carried by said shaft, a rock-shaft for moving said slidable member into and out of engagement with the stationary member, an operating-lever, means for actuating the rock-shaft on partial movement of this lever, and means for imparting rotary motion to said longitudinal shaft on continued movement of said lever.

2. In operating mechanism for car-brakes, the combination with a brake-chain and means for winding up the same, of a longitudinal shaft geared to said means, stationary and slidable clutch members carried by said shaft, a rock-shaft for moving said slidable member into and out of engagement with the stationary member, an operating-lever, means for actuating the rock-shaft on partial movement of this lever, and means for imparting rotary motion to said longitudinal shaft, from an axle of the car, on continued movement of said lever.

3. In operating mechanism for car-brakes, the combination with a brake-chain and a vertical shaft for winding up the same, of a longitudinal shaft geared to said vertical shaft, stationary and slidable clutch members carried by the longitudinal shaft, a rock-shaft for moving said slidable member into and out of engagement with said stationary member, an operating-lever, means for actuating the rock-shaft on partial movement of this lever, and means for imparting rotary motion to said longitudinal shaft on continued movement of said lever.

4. In operating mechanism for car-brakes, the combination with a brake-chain and a vertical shaft for winding up the same, of a longitudinal shaft geared to said vertical shaft, stationary and slidable clutch members carried by the longitudinal shaft, a rock-shaft for moving said slidable member into and out of engagement with said stationary

member, an operating-lever, means for actuating the rock-shaft on partial movement of this lever, and means for imparting rotary motion to said longitudinal shaft, from an axle of the car, on continued movement of said lever.

5. In operating mechanism for car-brakes, the combination with a brake-chain and means for winding up the same, of a longitudinal shaft geared to said means, stationary and slidable clutch members carried by said shaft, a rock-shaft for moving said slidable member into and out of engagement with said stationary member, a spring-restored operating-lever, means for actuating the rock-shaft on partial movement of this lever, and means for imparting rotary motion to said longitudinal shaft on continued movement of said lever.

6. In operating mechanism for car-brakes, the combination with a brake-chain and means for winding up the same, of a longitudinal shaft geared to said means, stationary and slidable clutch members carried by said shaft, a rock-shaft for moving said slidable member into and out of engagement with said stationary member, a spring-restored operating-lever, means for actuating the rock-shaft on partial movement of this lever, and means for imparting rotary motion to said longitudinal shaft, from an axle of the car, on continued movement of said lever.

7. In operating mechanism for car-brakes, the combination with a brake-chain and a vertical shaft for winding up the same, of a longitudinal shaft geared to said vertical shaft, stationary and slidable clutch members carried by the longitudinal shaft, a rock-shaft for moving said slidable member into and out of engagement with said stationary member, a spring-restored operating-lever, means for actuating the rock-shaft on partial movement of this lever, and means for imparting rotary motion to said longitudinal shaft, from an axle of the car, on continued movement of said lever.

8. In operating mechanism for car-brakes, the combination with a brake-chain and means for winding up the same, of a longitudinal shaft geared to said means, stationary and slidable clutch members carried by said shaft, a rock-shaft for moving said slidable member into and out of engagement with said stationary member, an operating-lever, a spring-restored rod for actuating the rock-shaft on partial movement of this lever, and means for imparting rotary motion to said longitudinal shaft on continued movement of said lever.

9. In operating mechanism for car-brakes, the combination with a brake-chain and means for winding up the same, of a longitudinal shaft geared to said means, stationary and slidable clutch members carried by said shaft, a rock-shaft for moving said slidable member into and out of engagement with said stationary member, a spring-restored operat-

ing-lever, a spring-restored rod for actuating the rock-shaft on partial movement of this lever, and means for imparting rotary motion to said longitudinal shaft, from an axle of the car, on continued movement of said lever.

10. In operating mechanism for car-brakes, the combination with a brake-chain and a vertical shaft for winding up the same, of a longitudinal shaft geared to said vertical shaft, stationary and slidable clutch members carried by said longitudinal shaft, a rock-shaft for moving said slidable member into and out of engagement with said stationary member, a spring-restored operating-lever, a spring-restored rod for actuating the rock-shaft on partial movement of this lever, and means for imparting rotary motion to the longitudinal shaft, from an axle of the car, on continued movement of said lever.

11. In operating mechanism for car-brakes, the combination with a brake-chain and means for winding up the same, of a longitudinal shaft geared to said means, stationary and slidable clutch members carried by said shaft, a rock-shaft for moving said slidable member into and out of engagement with said stationary member, an operating-lever, duplicate pivoted bell-crank levers, and a transverse rod connecting the inner arms thereof, a rod connected at one end to said rock-shaft, and at the other end to the outer arm of one of said bell-crank levers, another rod connected at one end to the outer arm of the other bell-crank lever, and extending lengthwise of the car, means for actuating the rock-shaft on partial movement of the operating-lever, and means for imparting rotary motion to said longitudinal shaft on continued movement of the operating-lever.

12. In operating mechanism for car-brakes, the combination with a brake-chain and means for winding up the same, of a longitudinal shaft geared to said means, stationary and slidable clutch members carried by said shaft, a rock-shaft for moving said slidable member into and out of engagement with the stationary member, an operating-lever, means for actuating the rock-shaft on partial movement of this lever, means for imparting rotary motion to said longitudinal shaft, from an axle of the car, on continued movement of said lever, said last-named means comprising a rod, a second rock-shaft, also a transverse shaft carrying other stationary and slidable clutch members, this stationary member being geared to said axle, devices actuated by the latter rock-shaft for throwing this slidable clutch member into and out of engagement with this stationary member, an additional shaft geared to the shaft last named, and rotatable connections between this additional shaft and the said longitudinal shaft.

13. In operating mechanism for car-brakes, the combination with a brake-chain and a vertical shaft for winding up the same, of a

longitudinal shaft geared to said vertical shaft, stationary and slidable clutch members carried by the longitudinal shaft, a rock-shaft for moving said slidable member into and out
5 of engagement with said stationary member, an operating-lever, means for actuating the rock-shaft on partial movement of this lever, means for imparting rotary motion to said longitudinal shaft, from an axle of the car,
10 on continued movement of said lever, said last-named means comprising a rod, a second rock-shaft, also a transverse shaft carrying other stationary and slidable clutch members, this stationary member being geared to

said axle, devices actuated by the latter rock- 15 shaft for throwing this slidable clutch member into and out of engagement with this stationary member, an additional shaft geared to the shaft last named, and rotatable connections between this additional shaft and 20 the said longitudinal shaft.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN H. BRUCE.

Witnesses:

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TERENCE MONROE.