

No. 655,376.

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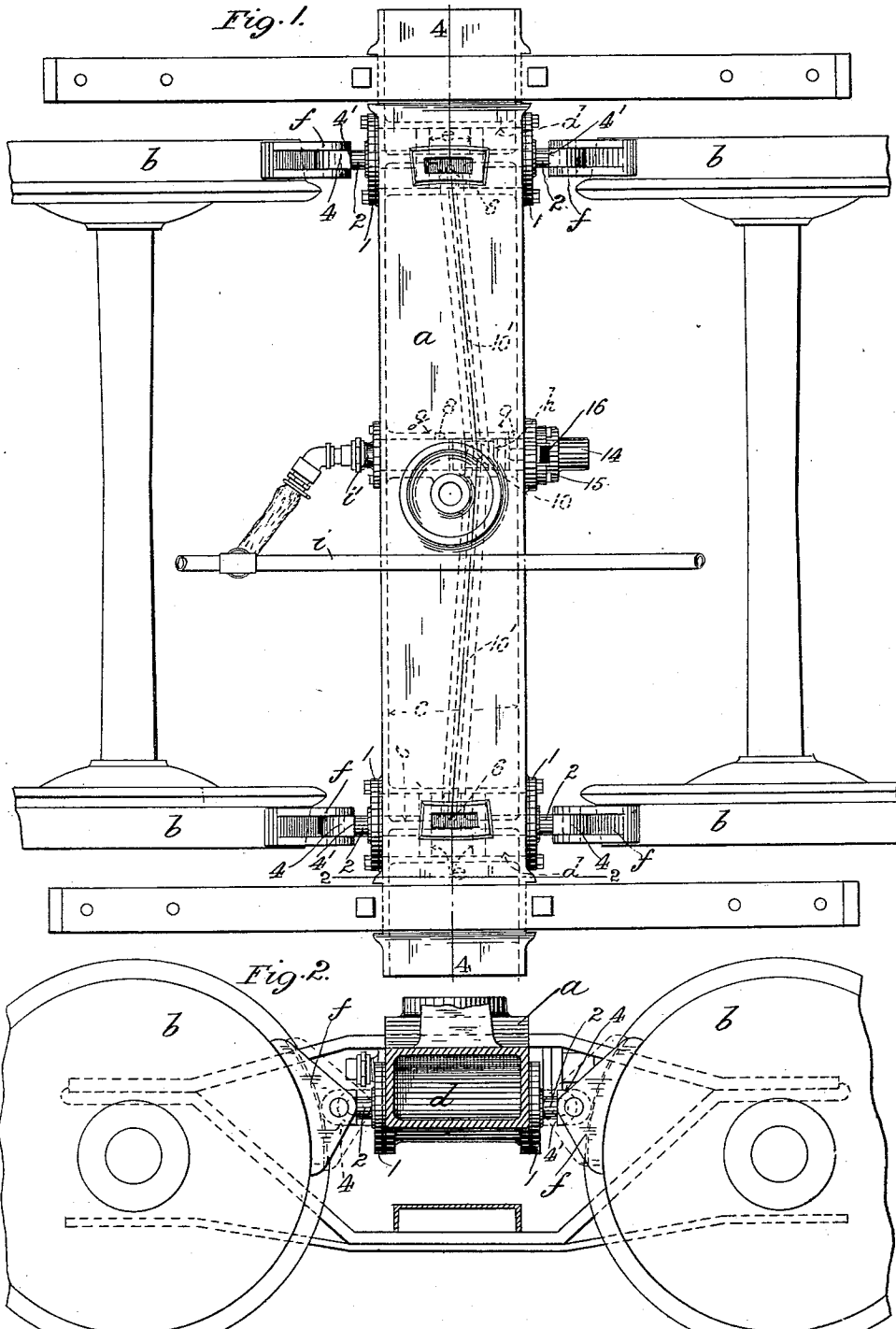
M. B. SCHAFFER & C. H. HOWARD.

BRAKE GEAR FOR RAILROAD CARS.

(Application filed Mar. 26, 1900.)

(No Model.)

4 Sheets—Sheet 1.



WITNESSES
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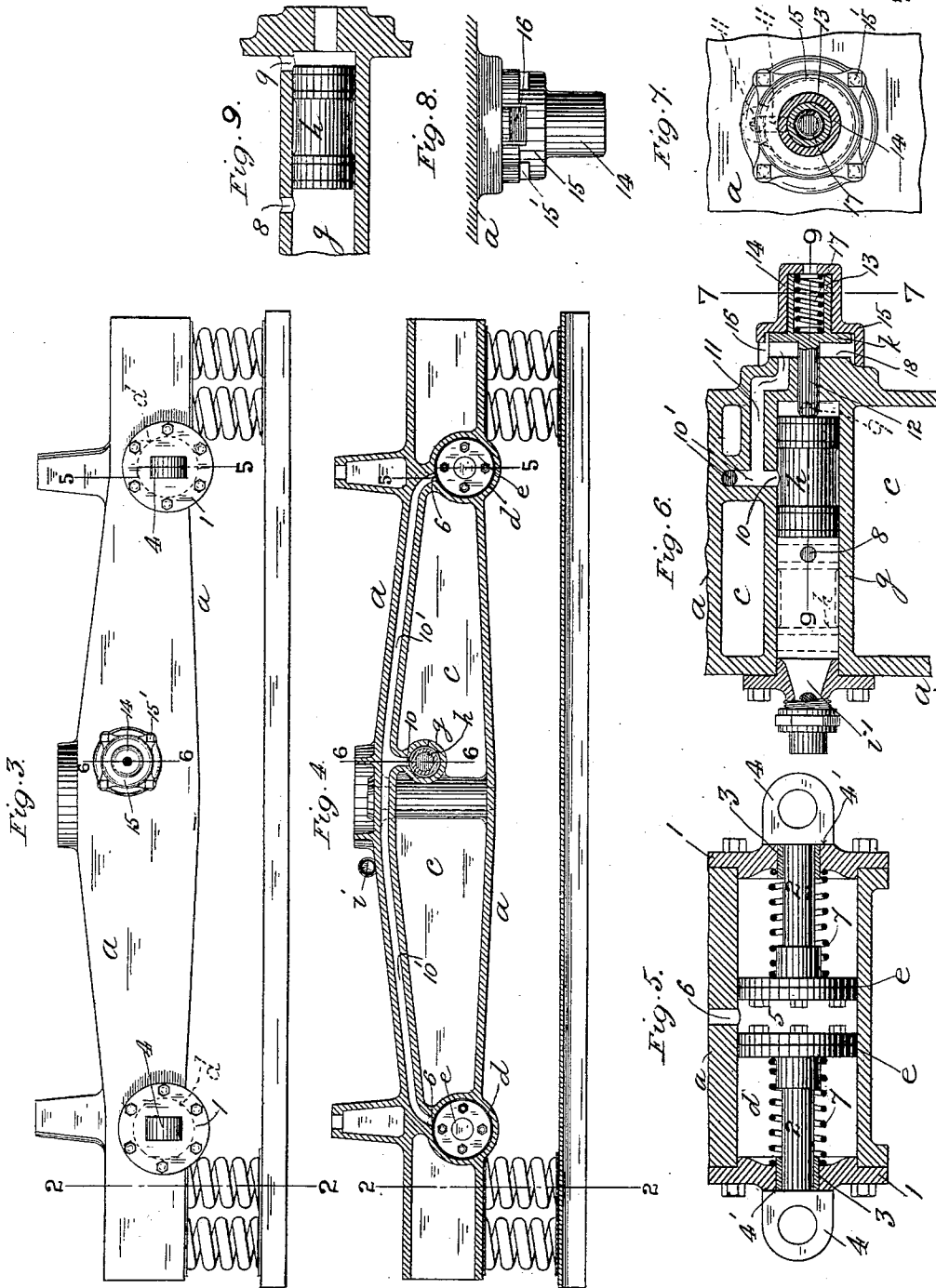
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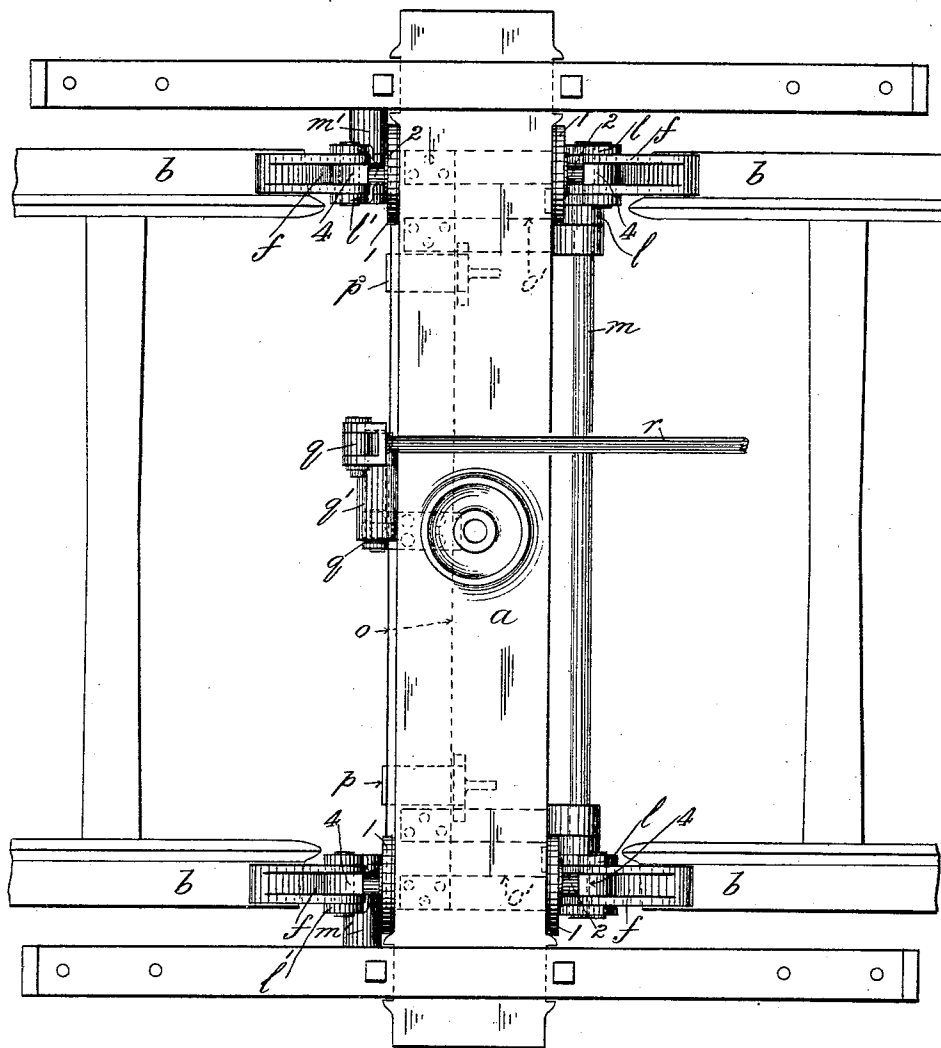
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4 Sheets—Sheet 3.

Fig. 10.



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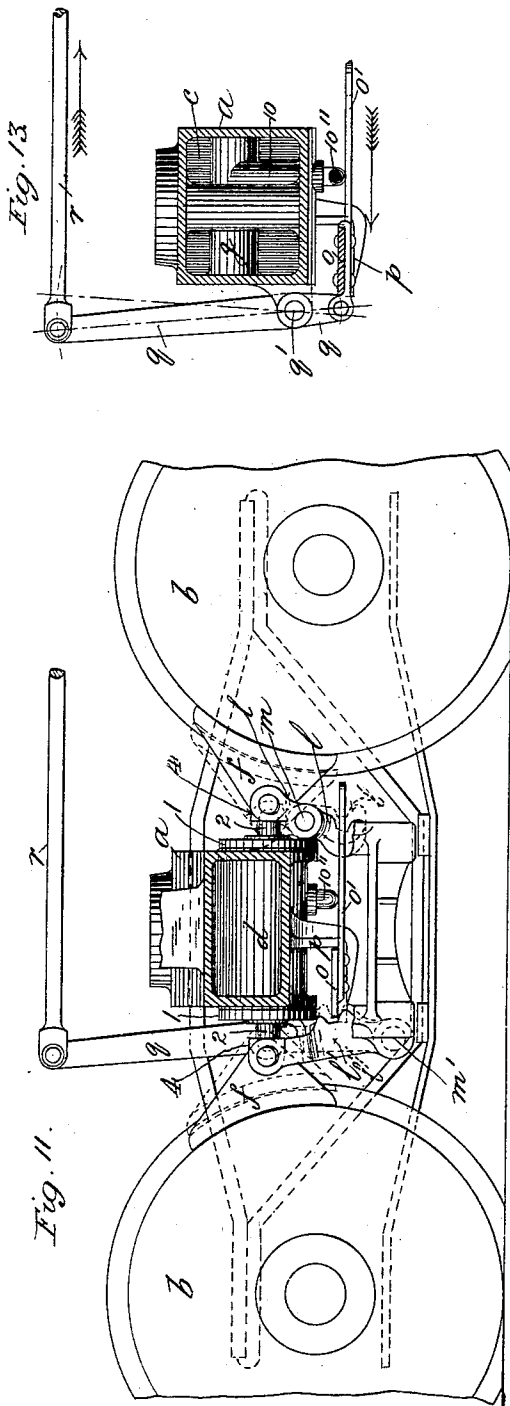
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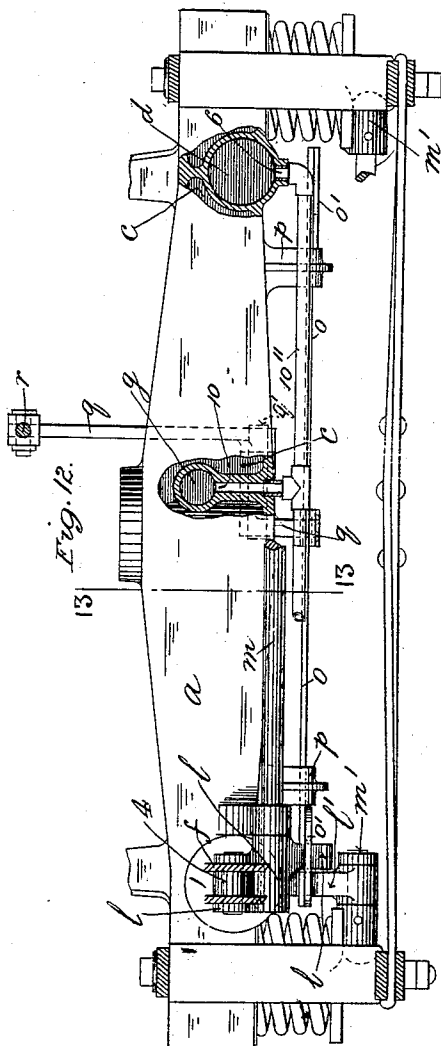
(Application filed Mar. 26, 1900.)

4 Sheets—Sheet 4.

(No Model.)



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UNITED STATES PATENT OFFICE.

MORSE B. SCHAFFER AND CLARENCE H. HOWARD, OF ST. LOUIS, MISSOURI.

BRAKE-GEAR FOR RAILROAD-CARS.

SPECIFICATION forming part of Letters Patent No. 655,376, dated August 7, 1900.

Application filed March 26, 1900. Serial No. 10,274. (No model.)

To all whom it may concern:

Be it known that we, MORSE B. SCHAFFER and CLARENCE H. HOWARD, citizens of the United States, residing at St. Louis, in the State of Missouri, have invented a new and useful Improvement in Brake-Gear for Railroad-Cars, of which the following is a specification.

Our invention relates, first, to air-brake gear for railroad-cars, and, secondly, to means combined therewith for operating the brakes by hand when the air is not available; and our invention has for its object to obtain a direct action of the air-brakes on the wheels without the intervention of levers, connecting-rods, and brake-beams now used in the "Westinghouse" and other systems of air-brake.

It consists in features of novelty as hereinafter described and claimed, reference being had to the accompanying drawings, forming part of this specification, whereon—

Figure 1 is a top plan of a car-truck bolster and wheels appertaining thereto broken away with our improved air-brake gear applied thereto; Fig. 2, a vertical transverse section through the bolster on line 2 2 in Figs. 1, 3, and 4, omitting the bolster-springs, axle-boxes, and other parts not necessary for the illustration of our invention and showing the car-wheels broken away in outside elevation; Fig. 3, a side elevation of the bolster with combined parts of our invention as seen from the right of Fig. 1; Fig. 4, a vertical longitudinal section through the bolster and the said parts on line 4 4 in Fig. 1; Fig. 5, a vertical transverse section, to enlarged scale, through the bolster broken away and a vertical longitudinal section through one of the air-brake cylinders combined therewith on line 5 5 in Figs. 3 and 4, showing the cylinder-pistons and their appendages; Fig. 6, a similar view to Fig. 5 through the bolster and triple-valve chamber combined therewith on line 6 6 in Figs. 3 and 4, showing the valves and their appendages; Fig. 7, a transverse sectional elevation, on line 7 7 in Fig. 6, through the brake-cylinder exhaust-valve and its box attached to the right-hand end of the triple-valve chamber; Fig. 8, a top plan of the same; and Fig. 9, a horizontal section through the triple-valve

chamber, broken away, on line 9 9 in Fig. 6. Figs. 10, 11, and 12 are views of the bolster corresponding to Figs. 1, 2, and 3, respectively, showing means for operating the brakes by hand in lieu of air; and Fig. 13, a vertical transverse section through the bolster on line 13 13 in Fig. 12.

Like letters and numerals of reference denote like parts in all the figures.

a represents a car-truck bolster, and *b* the car-wheels appertaining thereto. The bolster *a* is preferably an integral hollow casting of a rectangular-box shape in cross section, which for a suitable portion of its interior is closed to the external atmosphere, so as to form a reservoir *c* for containing compressed air.

In the bolster *a*, transversely thereto and centrally alined to the brake bearing-surface of the car-wheels *b* at each side of the truck, is formed or fixed an air-brake cylinder *d*, (seen particularly in Fig. 5,) which is arranged horizontally and preferably closed at the ends by heads or covers 1, and within each cylinder *d* are fitted two pistons *e*, having, respectively, a piston-rod 2, which passes through a guide 3 in the corresponding head 1 and terminates outside the head 1, preferably in a cross-head 4, having a shoulder 4', which when the piston *e* is at the inner end of its stroke in the cylinder *d* butts against the outside of the guide 3, and thereby limits the inward movement of the piston *e*. In this position of the parts a suitable space 5 is left between the pistons *e*, and from this space 5 an opening 6 communicates with the triple-valve chamber, as hereinafter more particularly described. To the cross-head 4 of each piston-rod 2 is coupled the brake-shoe *f*, which is of the usual construction and adapted to bear against the corresponding car-wheel *b*. Between each piston *e* and the guide 3 or head 1 is a spiral spring 7, which surrounds the piston-rod 2 and normally holds the piston *e* at the inner end of its stroke, with the shoulder 4' of its cross-head 4 against the outside of the guide 3.

In the bolster *a*, transversely thereto and preferably midway or thereabout between the air-brake cylinders *d*, is formed or attached a preferably-cylindrical valve-chamber *g*, containing a correspondingly-shaped

valve *h*, which is adapted to slide air-tight along the chamber *g*. The valve-chamber *g* is in communication at one end with the train-pipe *i*, which supplies compressed air from the force-pump on the locomotive and is similar in other respects to the ordinary train-pipe of the Westinghouse air-brake.

In the valve-chamber *g*, at a suitable distance from the inlet-opening *i'* thereto of the train-pipe *i*, is an opening 8, through which the compressed air entering the valve-chamber *g* from the train-pipe *i* is admitted into the reservoir *c*, and in the valve-chamber *g*, at or in proximity to its end opposite to that of the train-pipe inlet *i'*, is an opening *g*, through which compressed air from the reservoir *c* is admitted to the valve-chamber *g* and thence through an opening 10 and passage 10' and through the openings 6, before mentioned, into the brake-cylinders *d*. From the passage 10' outside the valve-chamber *g* is a passage 11, which opens into the atmosphere adjacent to the end of the valve-chamber *g* opposite to that of the train-pipe inlet-opening *i'*. The opening 11 is opened and closed by a valve *k*, having on its face a central stem 12, which passes air-tight through this end of the valve-chamber *g* and projects a suitable distance into the latter. The valve *k* is formed on its outside with a central tubular shank 13, which slides within a correspondingly-shaped guide 14, formed in the valve-box 15, which is secured to the end wall of the valve-chamber *g* by bolts 15', as shown. In the valve-box 15 is a hole or holes 16, which permit of the escape of the air from the opening 11 into the atmosphere. Within the tubular shank 13 of the valve *k* is a spiral spring 17, which bears at its outer end against the bottom or rear end of the guide 14 and normally forces the valve *k* onto its seat 18, so as to close the opening 11, or, if desired, in lieu of the chamber *g* and valve arrangement above described any other suitable triple valve may be used in communication with the cylinder, train-pipe, and reservoir.

In operation, assuming the pistons *e* to be at the inner end of their stroke in the cylinders *d*, as seen in Fig. 5, and the brake-shoes *f* out of contact with the wheels *b*, as indicated by dotted lines in Fig. 1, and the valves *h* and *k* of the triple valve in the position shown by full lines in Fig. 6, on reducing the air-pressure in the train-pipe *i* and chamber *g* at that side of the valve *h* the compressed air supplied from the reservoir *c* through the opening 9 into the chamber *g* on the other side of the valve *h* moves the valve *h* over to the train-pipe end of the chamber *g* or into the position indicated by dotted lines in Fig. 6, which closes the opening 8 for preventing the escape therethrough of the air in the reservoir *c* and uncovers the opening 10, which allows the air entering the chamber *g* through the opening 9 from the reservoir *c* to pass through the passage 10' and openings 6 into

the cylinders *d* between the pistons *e*, which are thereby forced apart or outward toward the ends of the cylinders *d*, or so as to move the brake-shoes *f* into contact with the wheels *b*, the exhaust-opening 11 being in the meantime closed by its valve *k*, actuated by the spring 17. To release the brakes, the air-pressure is renewed in the train-pipe *i*, and thereby returns the valve *h* to its original position, and in so doing uncovers the opening 8, so as to readmit air to the reservoir *c*, and at the same time closes the opening 10, thereby shutting off the supply of air from the reservoir *c* to the cylinders *d*, and then striking the stem 12 of the valve *k* forces the latter from its seat 18, which compresses the spring 17 and uncovers the opening 11, thereby allowing the compressed air to be exhausted from the cylinders *d* through the openings 6, passage 10', and openings 11 and 16 into the atmosphere, and in so doing the resilience of the springs 7 returns the pistons *e* and brake-shoes *f* to their original position, or so as to release the brakes from the wheels *b*.

The walls of the passage 10' are preferably made integral with the bolster *a*, as shown particularly in Fig. 4, but may be separately constructed, if desired, by pipes and their connections 10'', as shown in Fig. 10.

Figs. 10, 11, 12, and 13 illustrate means for operating the pistons *e*, with their rods 2, springs 7, cross-heads 4, and brake-shoes *f*, by hand in lieu of air. For this purpose the cross-heads 4, with the brake-shoes *f* for the two car-wheels appertaining to each cylinder *d*, are respectively coupled to the end of levers *l* and *l'*, the lever *l* for one wheel being of the first kind and the lever *l'* for the other wheel of the third kind. The levers *l l'* are preferably inclined downward toward each other to their fulcrums *m m'*, which are carried by any available part of the bolster *a* or truck-frame.

Beneath the bolster *a* is a brake-beam *o*, which is arranged flatwise horizontally and transversely to the truck between the levers *l l'*, with its outer longitudinal edge normally in contact with the inner edges of the levers *l l'*, which edges are adapted for engagement simultaneously by the beam *o*, as shown. From the beam *o* project rearward two yokes *o'*, one at each side of the truck, which straddle and engage the outer edges of the levers *l* simultaneously with the engagement of the beam *o* with the levers *l'*. The beam *o* is supported and guided by brackets *p*, depending from the bolster *a*. To the middle of the beam *o* is coupled the short arm of a vertically-arranged lever *q* of the first kind, having its fulcrum *q'* carried by the bolster *a* and its long arm extending upward toward the car-sills, where it is coupled to the end of a horizontal rod *r*, which is operated by the ordinary chain and hand-wheel at the end of the car.

In operation, assuming the pistons *e* to be at the inner end of their stroke in the cylin-

ders d , as seen particularly in Fig. 5, with the brake-shoes f out of contact with the wheels b and the levers l' in the position indicated by the dotted lines in Fig. 11, or in contact, respectively, with the yokes o' and beam o , on pulling the rod r in the direction indicated by the arrow in Fig. 13 the lever q moves the beam o , with its yokes o' , in the opposite direction and in so doing forces the levers l' to move about their fulcrums $m m'$, so as to throw the brake-shoes f , to which they are respectively coupled, over in opposite directions into contact with the corresponding wheels b . On releasing the rod r the lever q , brake-beam o , levers l' , and brake-shoes f are returned to their original position by the springs 7 of the cylinders d , as in the case of the air-brake gear before described.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. In brake-gear for a railroad-car, the combination of a cylinder containing two pistons and having its cylindrical wall integral with the truck-bolster, a rod attached to each of the said pistons and passing through a fixed guide at a suitable distance from the piston, a brake-shoe coupled to the outer end of the said rod and adapted to bear against the car-wheel, a spring between the piston and the said guide, a suitable triple valve in communication with a train-pipe supplying compressed air and adapted to admit the air from the said pipe into a compressed-air reservoir, and from the reservoir into the said cylinder, and means for exhausting the compressed air from the cylinder into the atmosphere, the inclosing walls of the said valve and reservoir being integral with the truck-bolster, substantially as described.

2. In brake-gear for a railroad-car, the combination with the truck-bolster of a cylinder located on the bolster and containing two pistons, a rod attached to each piston and passing through a fixed guide at a suitable distance from the piston, a brake-shoe coupled to the outer end of the said rod and adapted to bear against the car-wheel, a spring between the piston and the said guide, a suitable triple valve in communication with a train-pipe supplying compressed air and

adapted to admit the air therefrom into a compressed-air reservoir and from the reservoir into the cylinder, and means for exhausting the compressed air from the cylinder into the atmosphere, substantially as described.

3. In brake-gear for a railroad-car, the combination with the truck-bolster of a cylinder containing two pistons, a rod attached to each piston and passing through a fixed guide at a suitable distance from the piston, a brake-shoe coupled to the outer end of the said rod and adapted to bear against the car-wheel, a spring between the piston and the said guide, a passage from the cylinder into a cylindrical valve-chamber, formed in the bolster and containing a slide-valve and having openings communicating respectively with a train-pipe supplying compressed air and with a compressed-air reservoir, an outlet from the said passage into the atmosphere, and a valve adapted to open and close the said outlet, substantially as described.

4. In brake-gear for a railroad-car, the combination with the truck-bolster, of a cylinder containing two pistons, a rod attached to each piston and passing through a fixed guide at a suitable distance from the piston, a spring between the piston and the said guide, a brake-shoe coupled to the outer end of the said rod and adapted to bear against the car-wheel, a lever of the first kind, and a lever of the third kind, coupled respectively to the joint of the brake-shoe and rod of each piston, and fulcrumed to the car-truck, a beam arranged horizontally and transversely to the truck between the said levers, and bearing against the inner edge of the lever of the third kind, and having a yoke straddling and bearing against the outer edge of the free arm of the lever of the first kind, brackets supporting the said beam, and means for moving the beam horizontally in one direction for imparting a corresponding movement to the said levers about their fulcrums, substantially as described.

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