

(No Model.)

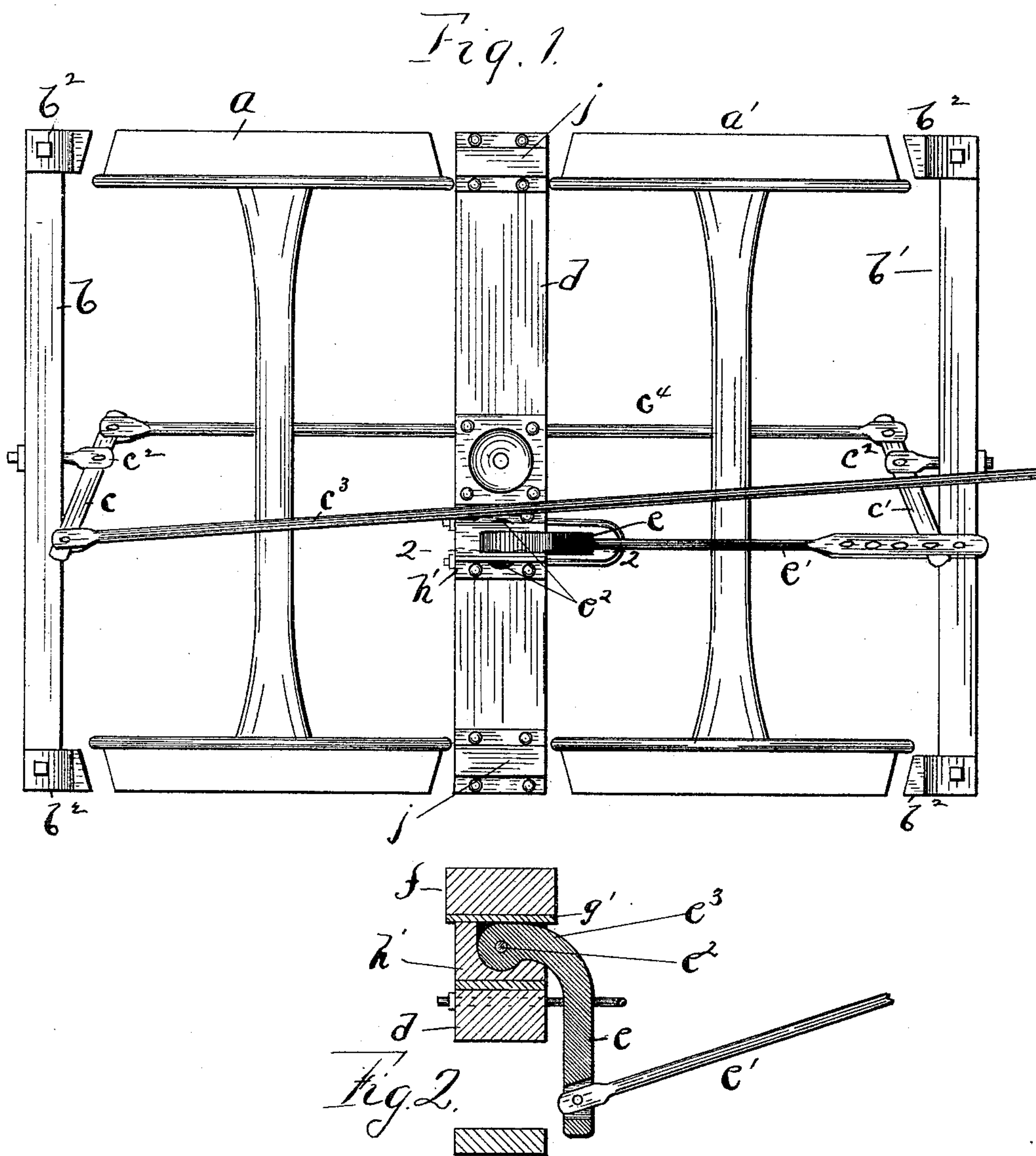
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T. S. E. DIXON.

CAR BRAKE.

No. 414,108.

Patented Oct. 29, 1889.



Witnesses
W. M. Hill.
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Inventor:
T. S. E. Dixon,
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(No Model.)

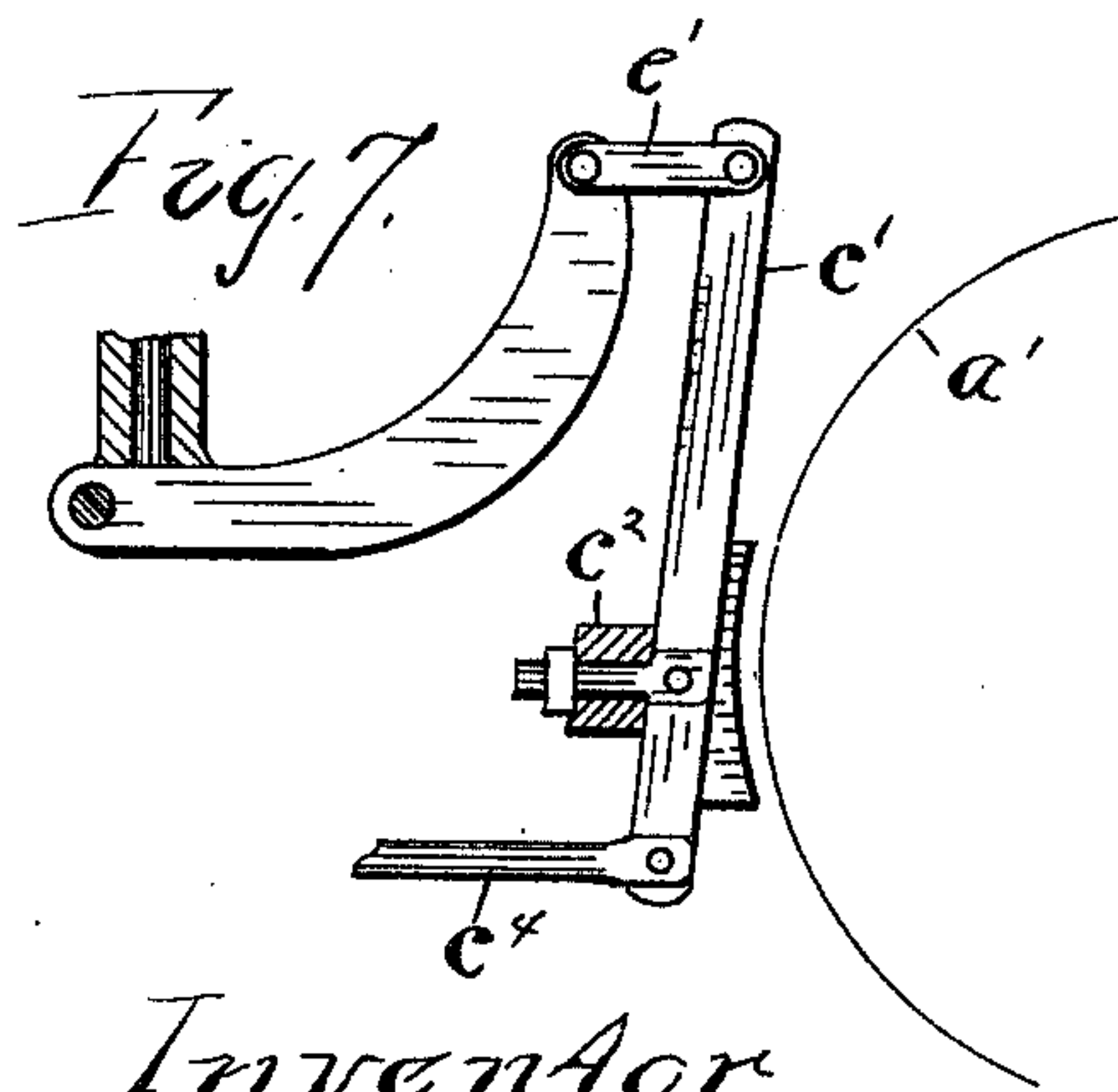
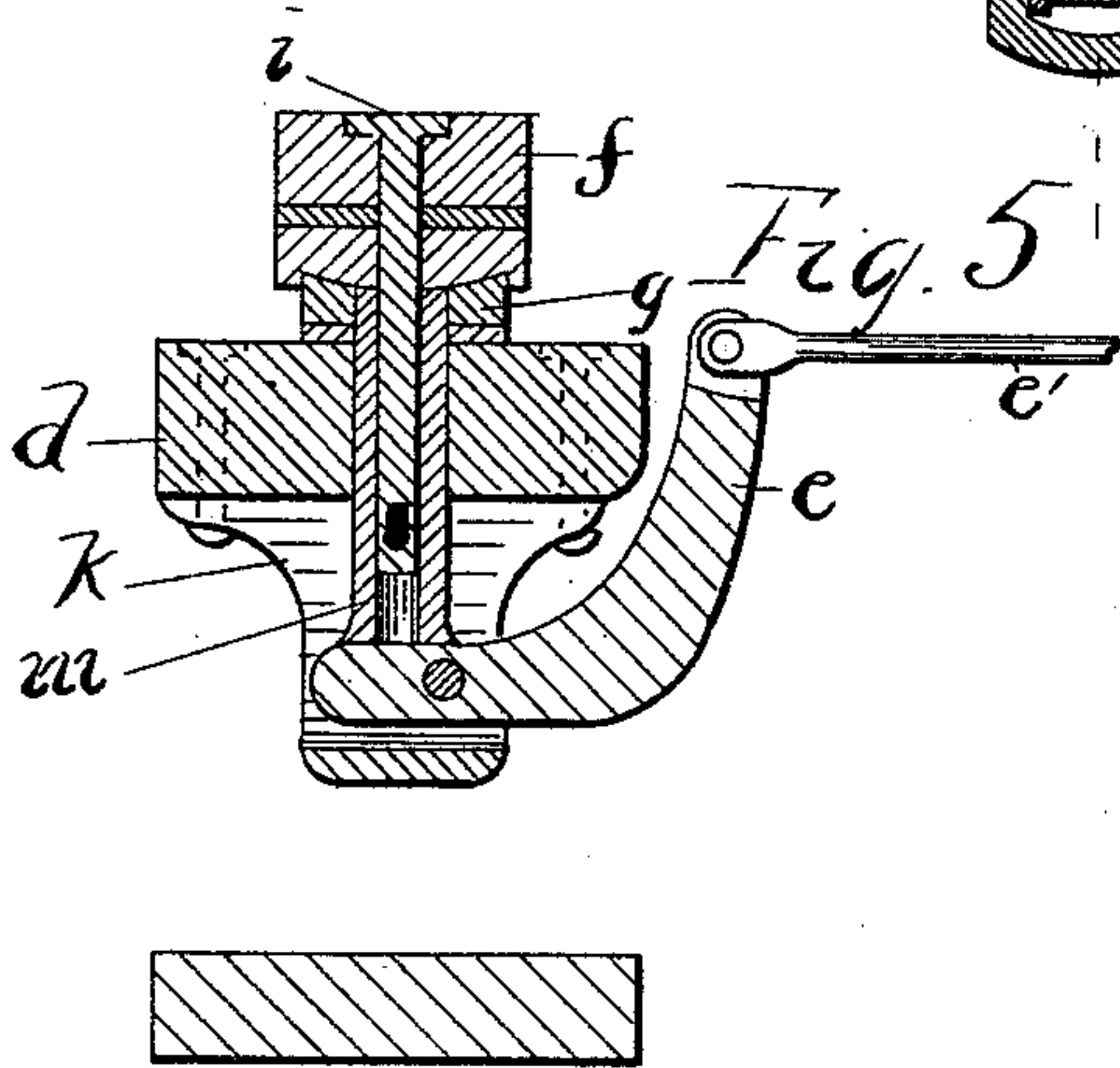
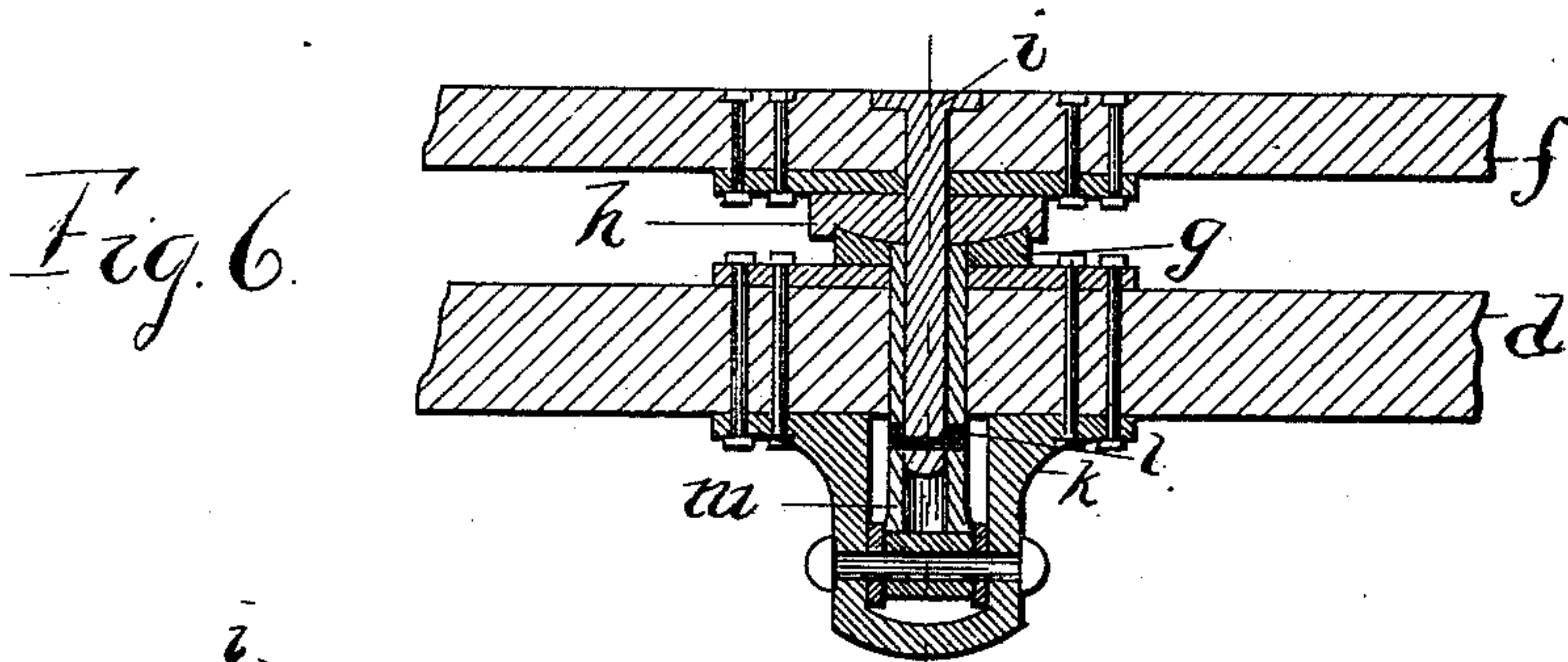
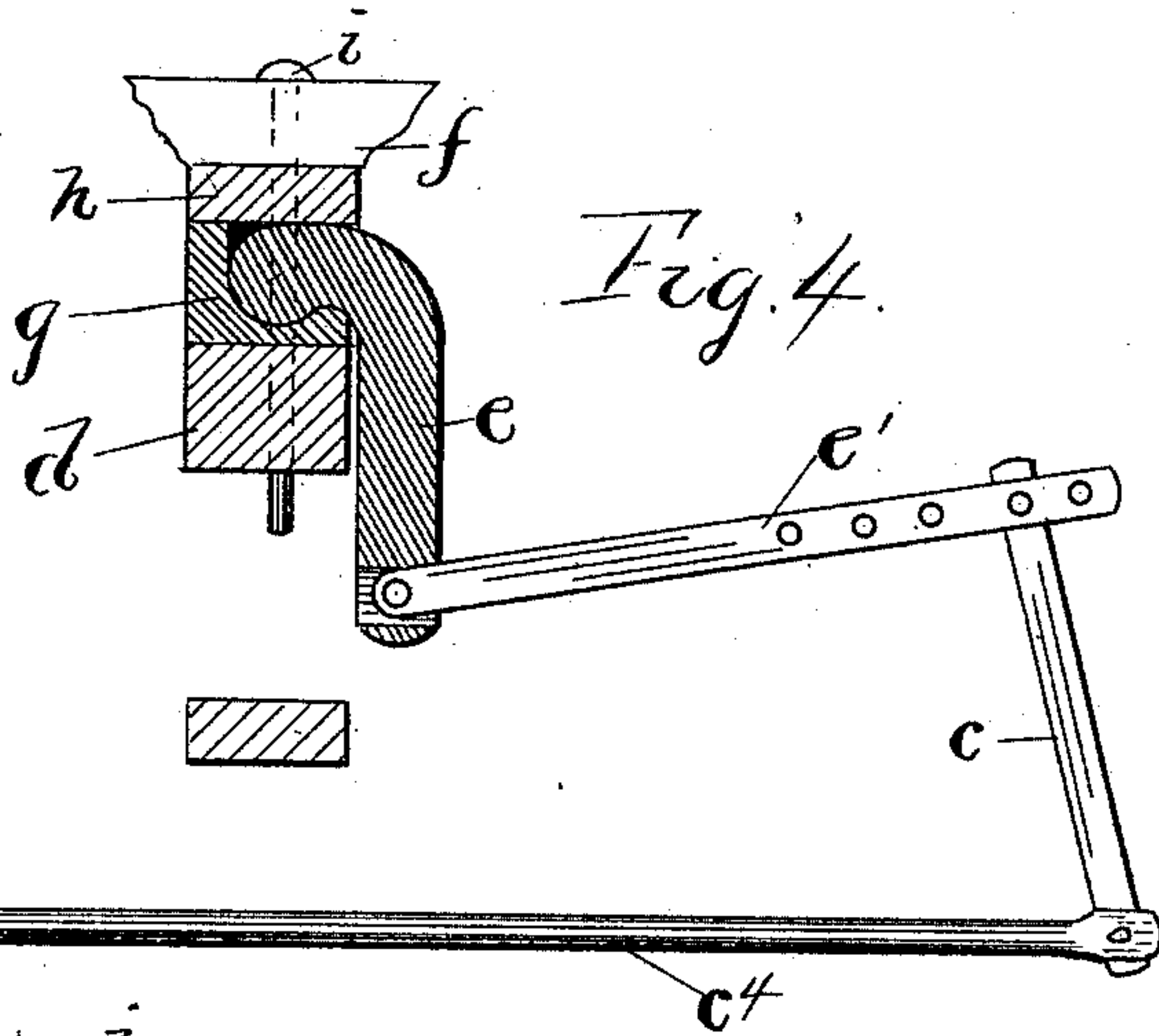
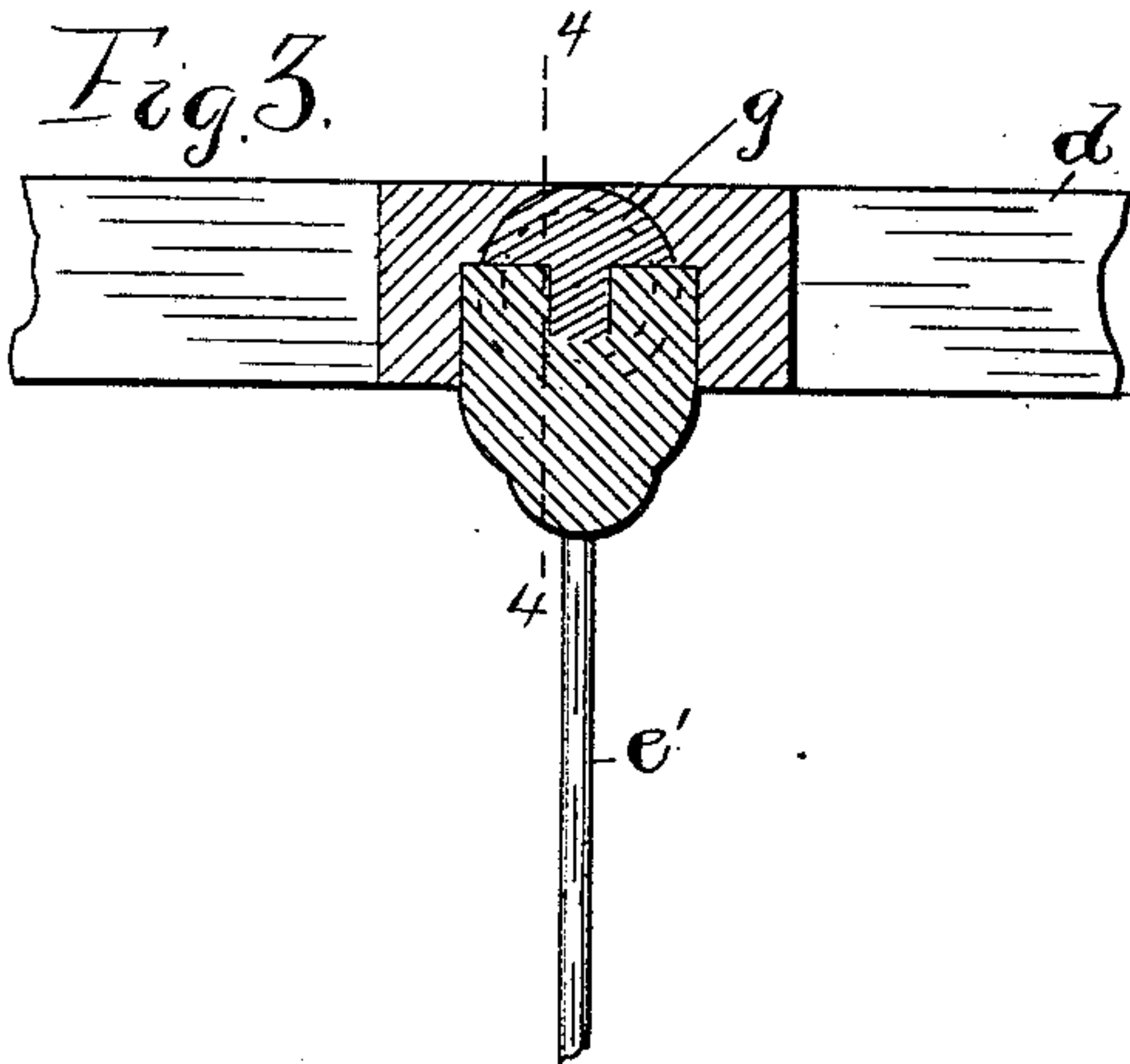
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UNITED STATES PATENT OFFICE.

THERON S. E. DIXON, OF CHICAGO, ILLINOIS.

CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 414,108, dated October 29, 1889.

Application filed August 10, 1889. Serial No. 320,382. (No model.)

To all whom it may concern:

Be it known that I, THERON S. E. DIXON, a citizen of the United States of America, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Car-Brakes, of which the following is a specification.

Referring to the accompanying drawings, wherein similar reference-letters indicate the same or corresponding parts, Figure 1 is a top plan of the truck, showing a practicable arrangement of the brake levers and rods. Fig. 2 is a vertical cross-section in line 2 2 of Fig. 1, including also the car-transom. Fig. 3 is a horizontal section through the truck-bolster, showing a modification. Fig. 4 is a vertical section of said modification, taken in lines 4 4 of Fig. 3. Fig. 5 is a vertical section showing another modification. Fig. 6 is a vertical section at right angles to the section shown in Fig. 5, and Fig. 7 represents a modification of the structure shown in Fig. 5.

The object of this invention is to provide a simple, cheap, effective, and therefore practical, means for automatically limiting the maximum brake-pressure of each car-truck by the weight carried by such car-truck without interfering with the normal operation of the brake mechanism when the pressure is below the maximum allowed for such weight, to the end that the wheels may be prevented from sliding on the track and yet receive all the brake-pressure which they are able to receive without danger of sliding.

The invention consists in the mechanical devices and combinations described in the following specification, and more particularly indicated in the claims appended thereto. It is especially adapted to the brake-gear of the Stevens, Hodge, and similar systems having a brake-lever for each brake-beam and transmitting the power from the brake rod or chain first to one of said levers and thence by a connecting rod, chain, or bar to the other, so as to get an equal brake-pressure on both pairs of wheels.

For clearness of description I will term the brake-lever which receives power directly from the brake-rod the "first" lever, and that which receives power from the connecting rod, bar, or chain the "second" lever, of the sys-

tem, and will preliminarily call attention to the fact that heretofore in this class of brakes the second lever has always had one end articulated to some fixed part of the truck.

The most important of the novel principles involved in my invention consists, first, in removing the rigid connection of the second lever and substituting a moving connection to a lifting device, which lifts against the weight of the car, so that both levers, instead of being held to their work by the rigid connection of the second, are held to their work by the weight of the car acting against the last end of the second lever; secondly, in employing as a lifting device for the purpose aforesaid a simple pry or crow-bar lever inserted between the truck-bolster and the car-bolster and tending merely to pry them apart; thirdly, arranging the pry transversely to said bolster and making it in the form of a bell-crank to avoid the necessity of introducing between the second lever and the pry devices for changing the direction of motion; and, fourthly, making the pry in the form of a combined lever and cam to increase its lifting-power, and at the same time insure its automatic return to its normal position after its work has been performed. These principles may be applied conjointly or separately with various modifications in the form of the mechanical devices. As illustrated in the drawings, they are all applied in one apparatus, which I will now proceed to describe.

In the drawings, *a a'* indicate the car-wheels; *b b'*, the brake-beams; *b²*, the brake-shoes; *c*, the first brake-lever; *c'*, the second brake-lever; *c²*, the point at which each brake-lever is articulated to its appropriate brake-beam; *c³*, the brake rod, chain, or bar by which power is transmitted from the windlass or brake-cylinder to the brake-lever *c*; *c⁴*, the connecting rod, bar, or chain by which power is transmitted from the first to the second brake-lever; *d*, the truck-bolster; *f*, the car-bolster; *g*, the lower center plate or chair-plate, attached to the truck-bolster; *h*, the upper center plate or chair-plate, attached to the car-bolster and resting upon the plate *g*; *i*, the king-bolt, extending down through the center plates; and *j j*, the usual side bearings. These parts are of any ordinary construction

and may be modified in any suitable way to adapt them to the application of my invention to different forms of car-truck.

Taking this old and well-known construction, it is only necessary by my invention to apply one additional part—to wit, a lifting-lever e , arranged transversely to the two bolsters—and to connect the last end of the second lever c' to such lifting-lever instead of to the car-truck, as heretofore, in order to leave the brakes perfectly free to operate in the usual manner so long as their force is insufficient to slide the wheels, whether the cars be empty or loaded, and to arrest their operation only when the pressure becomes such as to endanger sliding.

The pry e may be applied to the bolsters at the center plates or at any point or points between said plates and the end of the bolsters. The advantage of arranging it in the latter position is that it requires no change in the usual inclined position of the second lever c' , and that of arranging it in the former position is that it lifts both sides of the car equally. The constructor is at liberty to use either arrangement, as he may deem best, the effective principle being the same in both cases, because, if the car be loaded evenly, as it should be, the resistance to the lifting-lever will be proportionate to the weight borne by the truck in either case. The weight to be actually lifted by the lever will of course vary with the point of its application to the bolsters; but the constructor will compensate for this variation by varying the ratio of leverage.

In Figs. 3, 4, 5, 6, and 7 the lifting-lever is shown as applied at the center plates, and in Figs. 1 and 2 as applied between the center plates and the end of the bolsters.

Preferred details of application are as follows: First, when applied at the center plates, I provide the lower plate g with a recess to accommodate the short arm of the pry e , so that the latter will rest on or in the lower plate and pry against the upper plate h , any suitable means—for example, trunnions or a boss lying in a recess in the center plate—being employed to retain the lever in place. I also preferably slot the end of the lifting-lever vertically, as shown in Fig. 3, to enable it to lift at both sides of the king-bolt. The long arm of the lever e is connected to the last end of lever c' by any suitable means—for example, by a rod, chain, or bar e' . When applied away from the center plates, I attach plates $h' g'$ to the two bolsters, as shown in Fig. 2, arranging the end of the lever e in a recess in the lower plate, so that it will lift against the upper plate, as already described. In either position the lever e may, if preferred, be pivoted below the truck-bolster by a hanger k and lift the car-bolster by means of a lifting-bolt m , extending up through the former against the bearing-plate of the latter. In this arrangement the hanger may be regarded as constituting substantially a part of

the truck-bolster and the lifting-bolt as being a part of the car-bolster, the lifting-lever being applied as a pry between them, as already pointed out. At the center plates the lifting-bolt m will preferably be made tubular to accommodate the king-bolt and slotted at its lower end, as shown at l , to enable the king-bolt to be keyed to the truck.

In Fig. 1 the lifting-lever is shown provided with trunnions e^2 to hold it in place, and in Fig. 2 with a rounded head e^3 , which acts as a cam to aid in lifting the car, so that by reason of the increased power the long arm of the lever may be considerably shortened.

In all the drawings the lifting-lever is shown in the form of a bell-crank, which admits of a straight connection to the lever c' .

Figs. 1 to 6, inclusive, show the invention applied to "outside-hung" brakes. With slight modifications, hardly necessary to describe, it may equally as well be applied to "inside-hung" brakes—for example, by shifting the fulcrum-point to the end of the short arm and bending the long arm out far enough to give it sufficient clearance, as indicated in Fig. 7.

The great advantage of this improvement is that it combines efficient and certain operation with extreme simplicity and cheapness of construction. It involves no change in the standard brake-gear now in use, no special form of car-truck—being adapted or capable of easy adaptation to any of the standard trucks by means of simple and cheap appliances—and no special adjustment of the normal distance between the brake-shoes and the wheels.

In applying the brakes the first movement of the brake-rod c^3 acts to take up the slack, whatever it may be, and set the shoes against the wheels. Thereafter the weight of the car holds the brake-levers to their work and enables them to apply their full force to the car-wheels so long as the car does not lift; but when the car lifts, all further force applied by the brake-rod is expended in raising the car, without increasing the pressure of the shoes on the wheels. In other words, when the shoes act against the wheels my improvement comes into operation to fulcrum the brake-levers against the wheels, apply the power to one end of the lever c' , and hold the other end in place by the weight of the car, so that the brakes will act as usual till their limit of maximum pressure is attained, and the maximum pressure will always be directly proportional to the weight of the car and its load, and will be ascertained by multiplying the weight which bears on the lever into the ratio of leverage.

The device may be applied on both trucks of a car, if preferred; but with the present systems of brake-gear, which connect the brakes of one truck to those of the other, so that they are operated alike on both, there will be no special advantage in applying it to more than one, because when the brake-levers

of either truck yield by the rising of the car the effect will be communicated equally to the brake-levers of the other truck.

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

1. In a car-brake, the combination of the car-truck with a lever attached between its ends to a brake-beam and having one end connected to a rod, chain, or bar by which exterior power is transmitted to set the brakes and the other end connected to a device held in normal position by the weight or a portion of the weight of the car and adapted to yield when the force applied to it attains a predetermined relation to said weight, whereby the exterior power transmitted to set the brakes is limited in its effect to a maximum determined by the weight of the car, substantially as described.

2. In a car-brake, the combination of the truck and brake-beams with a first and second lever by which exterior power is applied to set the brakes, the end of the second lever being secured by a yielding attachment which yields when the force applied thereto attains a predetermined relation to the weight, whereby the exterior power transmitted to set the brakes is limited in its effect to a maximum determined by the weight of the car resting on the truck, substantially as described.

3. In a car-brake, the combination of the car, the truck, and the brake-beams with a series of connected brake-levers which transmit exterior power applied to set the brakes from one to another, and thus divide and equalize it, as described, and means whereby the last lever of the series is held to its work by the weight of the car resting on the truck, but permitted to yield when the force applied to it attains a predetermined relation to such weight, whereby the exterior power transmitted to set the brakes is limited in its effect to a maximum determined by the weight of the car, substantially as described.

4. In a car-brake, the combination of the

car, the truck, the brake-beams, and the brake-levers with a bell-crank lever having its short arm arranged to pry the car and truck apart and its long arm actuated by the brake mechanism through which exterior power is transmitted to set the brakes, and whereby the car-wheels are relieved from excessive pressure by the yielding of the car, substantially as described.

5. In a car-brake, the combination of the car, the truck, the brake-beams, and the brake-levers with a cam-lever arranged between the car and truck-bolster and when operated in the act of setting the brakes tending to force them apart by its cam-power and its lever-power, and thereby to relieve the car-wheels from excessive brake-pressure, substantially as described.

6. In a car-brake, the combination of the following elements, viz: a metal plate or casting attached to the underside of the car-bolster, a metal plate or casting attached to the upper side of the truck-bolster directly beneath the plate or casting first mentioned and having a recess formed therein to accommodate the end of the lifting-lever, and a lifting-lever having its short arm retained in said recess and lying between said plates, so as to pry them apart and lift the car to relieve the car-wheels from excessive brake-pressure, substantially as described.

7. In a car-brake, the combination of the truck and brake-levers which transmit exterior power to set the brakes, with an additional lever which affords by its connection a fulcrum in the system of brake-levers and is itself so fulcrumed as to tend to lift the car, whereby the system of brake-levers transmits and applies the braking-power and the additional lever limits the maximum of power applied in proportion to the weight of the car, substantially as described.

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