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PATENTED OCT. 29, 1907.

W. E. MONRO.

MEANS FOR CHECKING SIDE SLIP OF ROAD VEHICLES.

APPLICATION FILED JAN. 21, 1907.

3 SHEETS—SHEET 1.

Fig. 1.

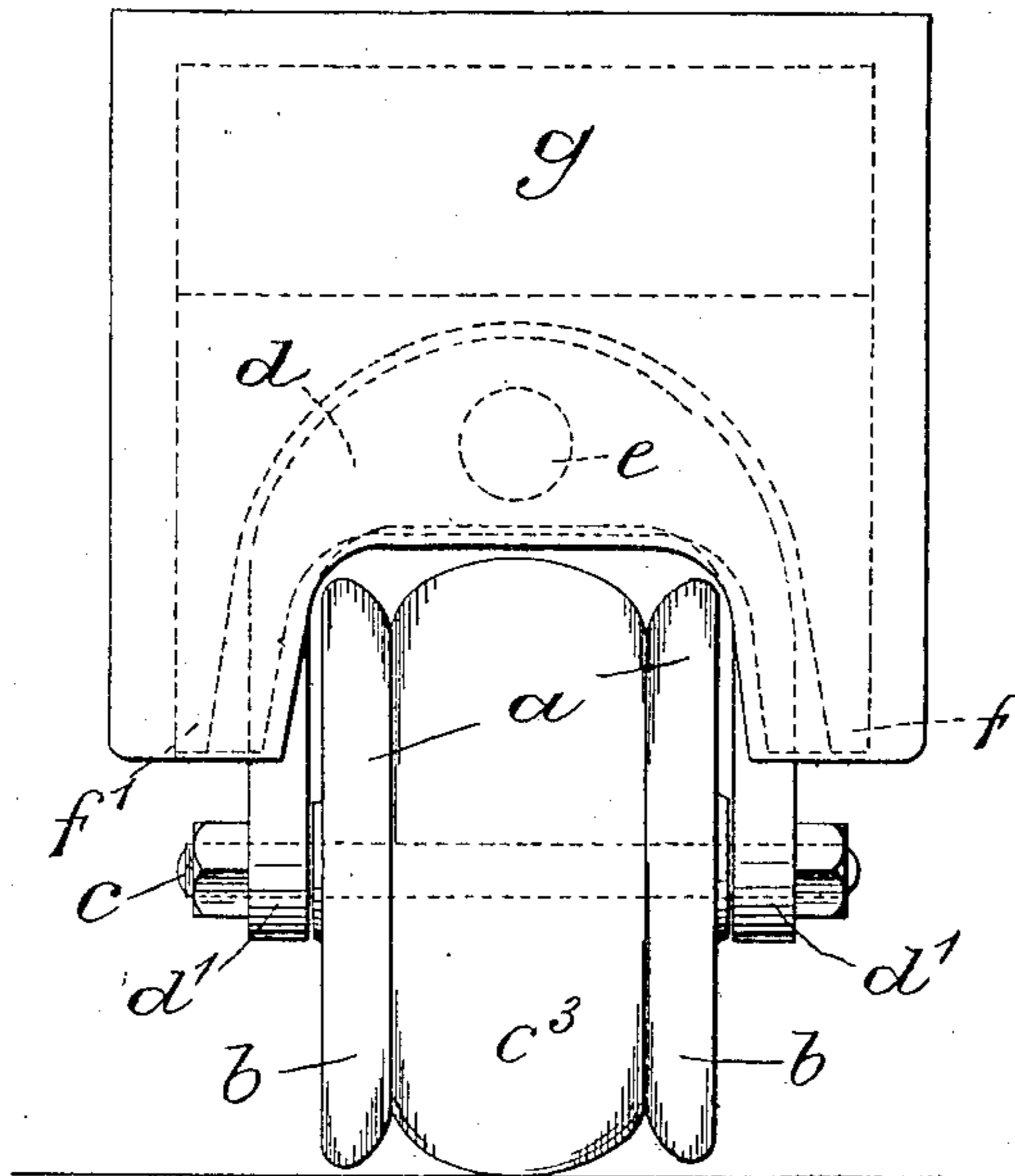
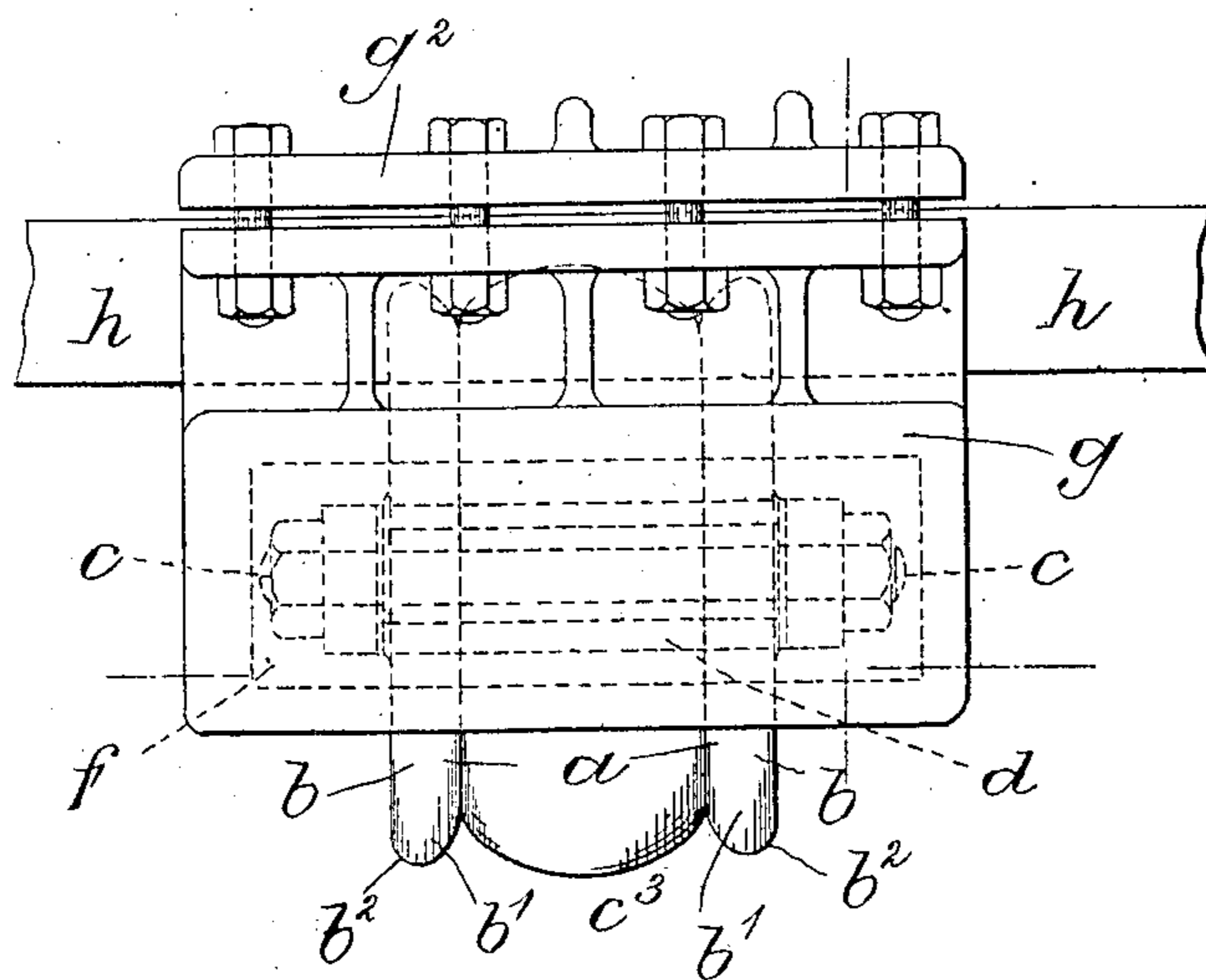


Fig. 2.



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3 SHEETS—SHEET 2.

Fig. 3.

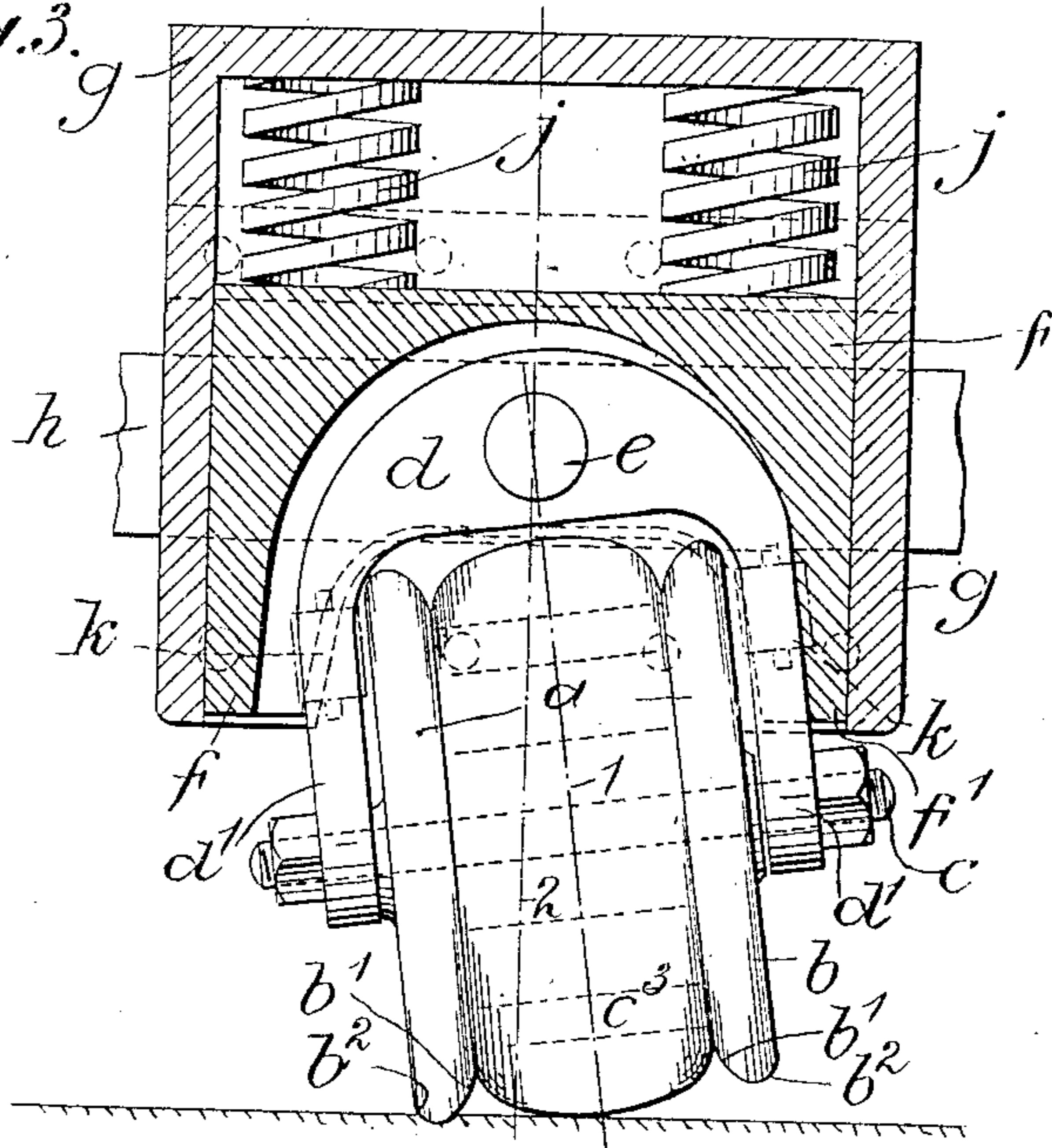
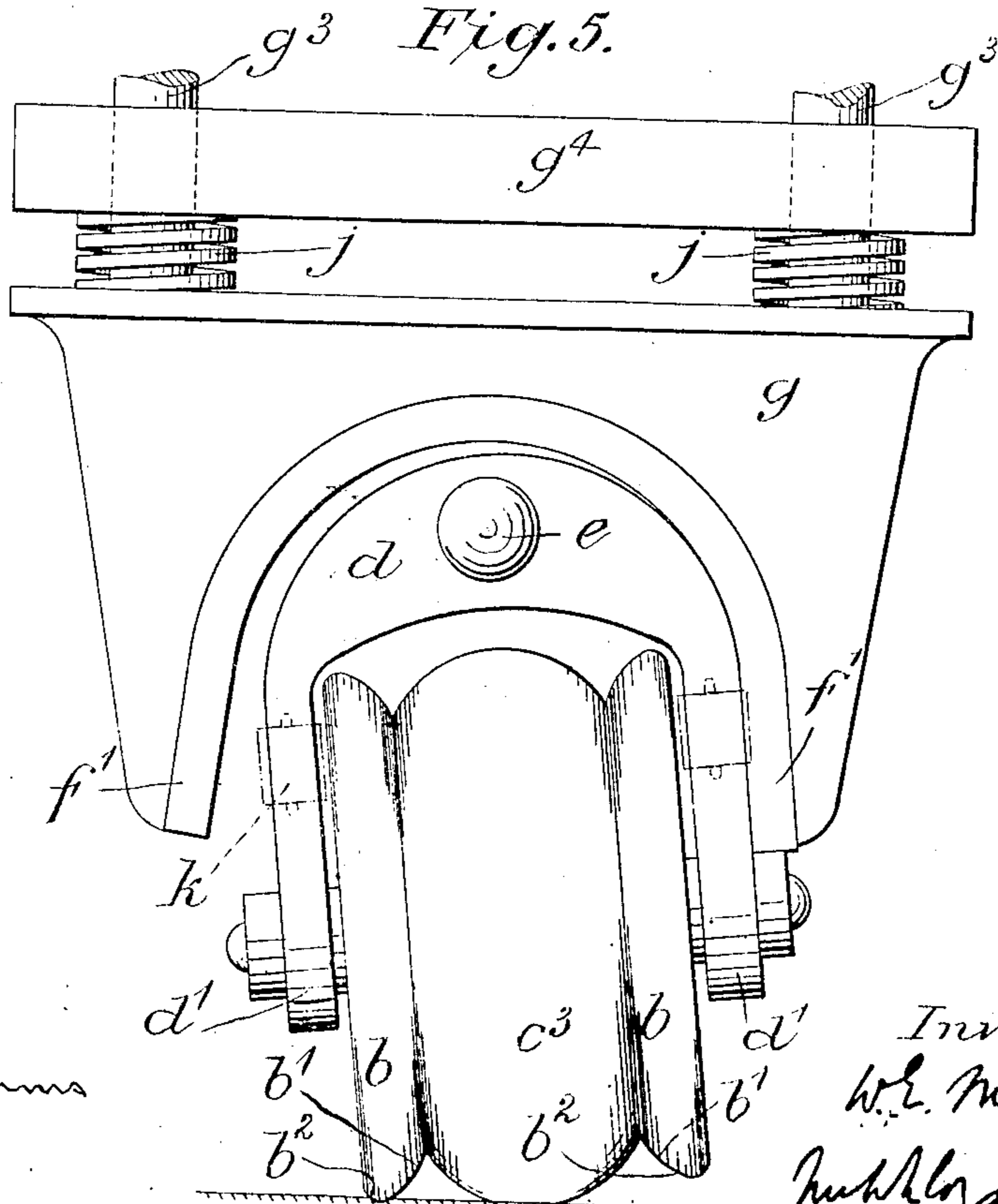


Fig. 5.



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3 SHEETS—SHEET 3.

Fig. 4.

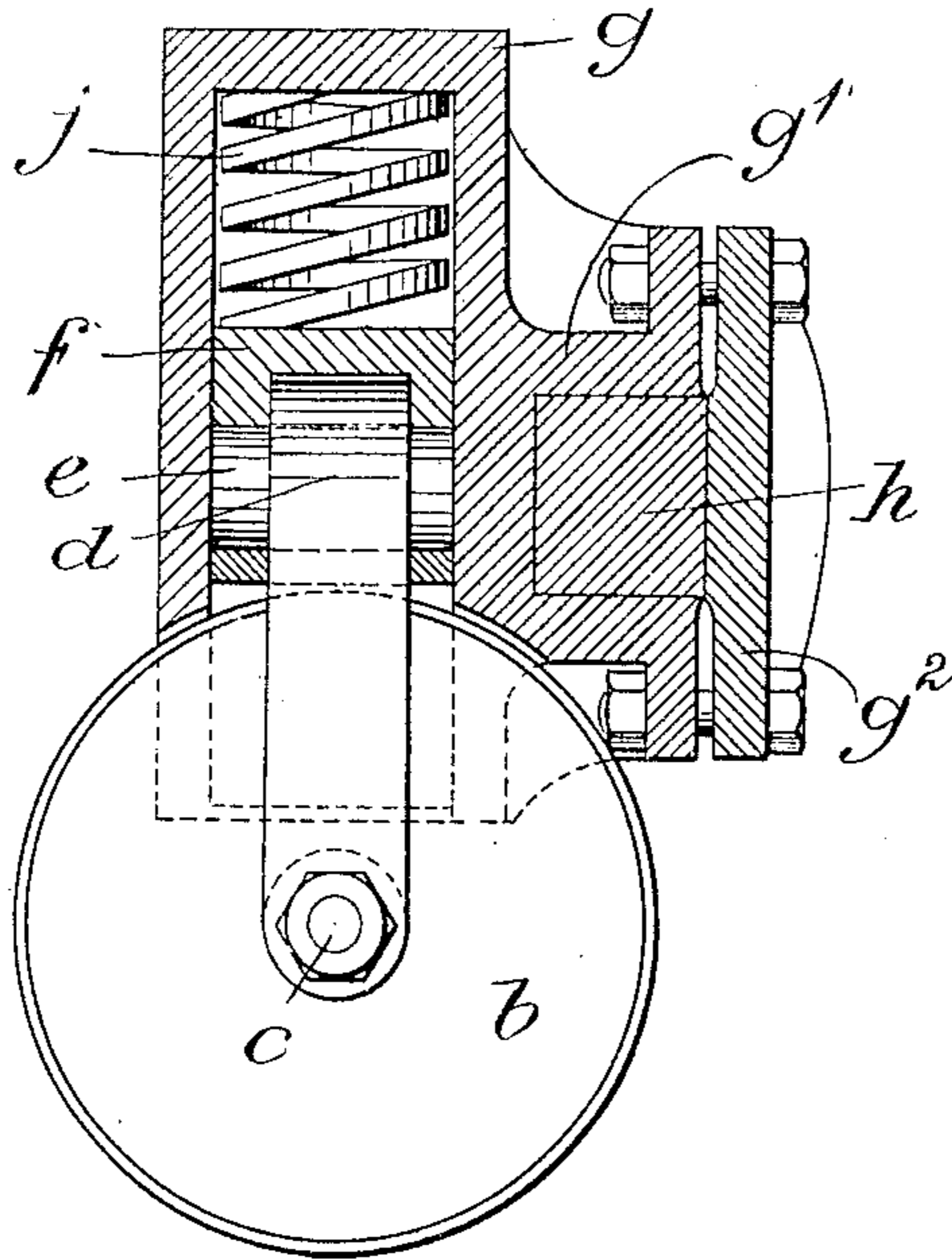
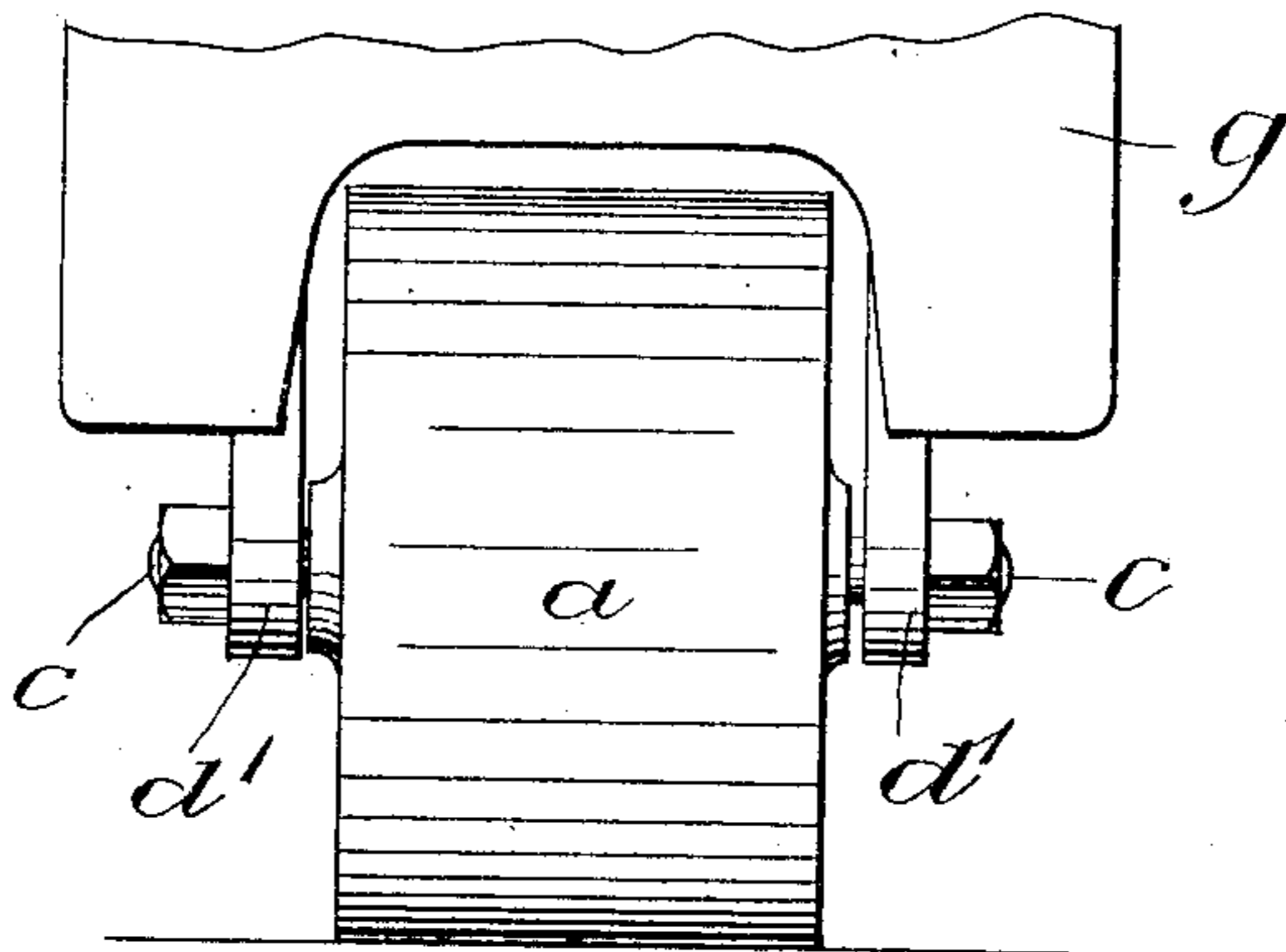


Fig. 6.



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UNITED STATES PATENT OFFICE.

WILLIAM ERNEST MONRO, OF LONDON, ENGLAND.

MEANS FOR CHECKING SIDE SLIP OF ROAD-VEHICLES.

No. 869,640.

Specification of Letters Patent.

Patented Oct. 29, 1907.

Application filed January 21, 1907. Serial No. 353,333.

To all whom it may concern:

Be it known that I, WILLIAM ERNEST MONRO, a subject of the King of Great Britain and Ireland, residing at London, England, have invented Improved Means for Arresting or Checking Side Slip of Road-Vehicles, of which the following is a specification.

This invention relates to means for arresting or checking side slip of the wheels of road vehicles initiated from any cause such as the so-called greasy state of the roads.

According to this invention one or more auxiliary and resiliently mounted wheels is or are employed which although not primarily adapted to assist in carrying the load of the vehicle will be affected thereby and held in contact with the road surface with a variable force, the tread of the wheel being comparatively broad and adapted to normally run true upon the roadway and to be tilted automatically to a limited extent when the vehicle slips or skids sidewise so as to run upon one edge which on account of its sharpness and the increase in weight thereon due to the displacement of a part of greater length than the part normally perpendicular to the roadway from one inclined position to a position more nearly approaching the perpendicular, will effectually arrest the side slipping action before any appreciable effect is noticeable. When the slipping tendency ceases, the wheel returns to the normal position automatically ready to be brought into action again as soon as occasion arises.

The accompanying drawings illustrate several constructions embodying the invention, Figure 1 being a front elevation, Fig. 2 a plan, Fig. 3 a sectional front view and Fig. 4 a sectional side view of the preferred arrangement. Figs. 5 and 6 are views similar to Fig. 1 of two modified arrangements.

In the example according to Figs. 1 to 4, *a* is a wheel formed of or with two metal rims or disks *b* spaced apart upon a suitable axle *c* and having their peripheries on the inner edge *b*¹ rounded or beveled so as to present more or less sharp outer edges *b*² to the roadway. The space between the rims or disks *b* is preferably occupied by a resilient tire or ring *c*³ so that when pressure is applied to the axle *c* the edges *c*² of the rims or disks *b* bear lightly upon or are just clear of the roadway. The axle *c* of the wheel is mounted within the free ends of a fork or yoke *d* carried by or upon a hinge pin *e* arranged longitudinally of the vehicle and mounted in an appropriate box *f* capable of vertical displacement within a saddle or bracket *g* secured to the underside of the vehicle say to the axle *h*, for which purpose the saddle or bracket *g* is formed with a flanged housing *g*¹ to receive the axle *h* and provided with a retaining cover or plate *g*². Springs *j* are located between the box *f* and the saddle or bracket *g*. The box *f* is as shown, formed interiorly or provided with extensions *f*¹ serving as stops or buffers to limit the tilt-

ing movement of the wheel *a* and fork *d*; and in order to relieve the axle *c* of stress when the wheel *a* is running on edge, small antifriction rollers *k* may be fitted to the fork *d* with their axes parallel to the limbs *d*¹ so as to engage the outer faces of the wheel rims or disks *b*. The box *f* acted on by the springs *j* and to which the wheel *a* and fork *d* are hinged, is wholly guided by the saddle or bracket *g*.

In practice it is preferred to arrange a wheel according to this invention for each pair of road wheels located midway therebetween, although in some cases one wheel will suffice for the whole vehicle while in other cases it may be desired to employ more than two.

Fig. 1 shows the wheel *a* in the out-of-action position, the tire *c*³ and rims or disks *b* revolving in a vertical plane. Immediately there is any movement of the vehicle transversely to the direction in which the same is normally traveling the frictional drag on the tire *c*³, or it may be upon the rims or disks *b* if the load on the vehicle is sufficient to cause the latter to normally bear lightly upon the roadway, will cause the wheel *a* to oscillate about the hinge pin *e* until arrested by one or other of the stops *f*¹ when it will assume the position indicated in Fig. 3 where the line marked 1, greater in length than the perpendicular line 2, having become displaced to a position more nearly perpendicular than in Fig. 1, illustrates that the pressure exerted on the rim or disk *b* in contact with the roadway has increased. In this condition further tendency of the wheel, and consequently the vehicle, to slip or skid sidewise is arrested.

In lieu of locating the resilient spring device between the wheel fork and saddle as in the foregoing example, the said fork might be hinged or pivoted directly to said saddle and the spring or other resilient device interposed between the saddle and the vehicle frame. Such a modification is shown in Fig. 5 where the saddle or bracket *g* is provided with guide bars *g*³ adapted to slide in a member *g*⁴ between which and the top of the said saddle or bracket *g* the springs *j* are arranged. In this case the saddle or bracket *g* is formed with the limiting extensions or stops *f*¹. As will be obvious the wheel *a* might possess a plain cylindrical surface of comparatively large width which when displaced will present a sharp edge to the roadway, as is for instance shown in Fig. 6, the resilient tire *c*³ being dispensed with.

What I claim is:—

1. In a road vehicle, means for arresting sidewise movement thereof comprising a member mounted to oscillate about an axis arranged longitudinally of the vehicle and carrying a wheel having sharp outer edges normally inactive upon the roadway but adapted to operatively engage the same when the wheel is tilted by sidewise movement of the vehicle.

2. In a road vehicle, means for arresting sidewise movement thereof comprising a wheel normally revolving in a

vertical plane, and having sharp edges normally inoperative upon the roadway, a carrying member for such wheel, a pin arranged longitudinally of the vehicle upon which the carrying member is hinged or pivoted so that it can tilt or oscillate and stops for arresting the wheel in a position where one or other of the sharp edges is operative upon the roadway.

3. In a road vehicle, means for arresting sidewise movement thereof comprising a wheel normally revolving in a vertical plane and having sharp edges normally inoperative upon the roadway, a carrying member for such wheel, a pin arranged longitudinally of the vehicle upon which the carrying member is hinged or pivoted so that it can tilt or oscillate, a device supporting said pin, means for yieldingly carrying the supporting device from the vehicle and stops for arresting the wheel in a position where one or other of the sharp edges is operative upon the roadway.

4. In a road vehicle, means for arresting sidewise movement thereof, comprising a wheel having a tread normally bearing on the roadway and sharp edges normally inoperative on such roadway, a carrying member for said wheel, a pin arranged longitudinally of the vehicle upon which the carrying member is hinged or pivoted so that it can tilt or oscillate when sidewise movement occurs, a device supporting said pin, resilient means for carrying the supporting device from the vehicle and stops arranged to arrest the wheel in a position where one or other of the sharp edges is operative upon the roadway.

5. In a road vehicle, means for arresting sidewise movement thereof comprising a wheel, having a comparatively wide tread and sharp outer edges normally running true upon the roadway, a carrying member therefor pivoted to a member resiliently connected to the vehicle and adapted to be oscillated to a limited extent, when sidewise movement occurs, to cause the wheel to run on one or other sharp edge.

6. In a road vehicle, means for arresting sidewise movement thereof, comprising a wheel, having a comparatively wide tread and sharp outer edges, normally running true upon the roadway, an oscillating member carrying said wheel which is resiliently connected to the vehicle between the ordinary carrying wheels thereof and means for arresting the wheel in a tilted position where it is caused to run on one or other sharp edge.

7. In a road vehicle, means for arresting sidewise movement thereof, comprising a wheel normally running true upon the roadway having a comparatively broad tread part of which is resilient, a carrying member therefor, a pin arranged longitudinally of the vehicle upon which the carrying member is hinged or pivoted so that it can tilt or oscillate when sidewise movement occurs, a device supporting said pin, resilient means for carrying the supporting device from the vehicle and stops arranged to enable the wheel when tilted to run on a portion of the tread which is now resilient.

8. In means for arresting sidewise movement of a road vehicle, the combination with the carrying wheels, of a subsidiary wheel having sharp outer edges normally inoperative upon the roadway but adapted when the wheel is tilted to engage such roadway, an oscillating carrier for such wheel, a device capable of vertical displacement to which the wheel carrier is connected and resilient means between the vertically moving device and the underside of the vehicle.

9. In means for arresting sidewise movement of a road vehicle, the combination with the carrying wheels of a subsidiary wheel having sharp outer edges normally inoperative upon the roadway but adapted when the wheel is tilted to engage such roadway, an oscillating carrier for such wheel, a device capable of vertical displacement to which the wheel carrier is connected, antifriction means between the wheel and the carrier, and resilient means between the vertically moving device and the underside of the vehicle.

10. In means for arresting sidewise movement of a road vehicle, the combination with the carrying wheels, of a

subsidiary wheel having sharp outer edges normally inoperative upon the roadway but adapted when the wheel is tilted to engage such roadway an oscillating carrier for the wheel, a device capable of vertical displacement to which the wheel carrier is hinged or pivoted longitudinally, a bracket secured to the vehicle and springs located between the vertically moving device and the said bracket.

11. In means for arresting sidewise movement of a road vehicle, the combination with the carrying wheels, of a subsidiary wheel having a comparatively broad tread and sharp outer edges normally inoperative but adapted when the wheel is tilted to engage such roadway an oscillating carrier for the wheel, a box to which the said carrier is hinged or pivoted longitudinally of the vehicle, a bracket secured to the vehicle within which the box aforesaid is arranged and adapted to move vertically and springs interposed between the said box and bracket.

12. In means for arresting sidewise movement of a road vehicle, the combination with the carrying wheels, of a subsidiary wheel, having sharp outer edges normally inoperative upon the roadway but adapted when the wheel is tilted to engage such roadway, a carrying fork for the wheel, a box to which the fork is connected, a hinge pin effecting said connection arranged longitudinally of the vehicle, a bracket secured to the axle of the vehicle within which the box aforesaid is mounted to slide vertically, springs interposed between the top of the box and the underside of the bracket and stops formed in the box for arresting the wheel carrying fork in a position such that the wheel can run on either of its sharp edges.

13. In means for arresting sidewise movement of a road vehicle, the combination with the carrying wheels, of a subsidiary wheel, a carrying fork therefor, a box to which the fork is connected by a hinge pin arranged longitudinally of the vehicle, a bracket secured to the axle of the vehicle within which the box aforesaid is mounted to slide vertically, springs interposed between the top of the box and the underside of the bracket, stops formed in the box for limiting the extent to which the wheel carrying fork can be oscillated and antifriction rollers between the sides of the subsidiary wheel and fork for reducing stress upon the wheel axle when the wheel is running on edge.

14. In means for arresting sidewise movement of a road vehicle, the combination with the carrying wheels of a subsidiary wheel comprising outer metal rims or disks and an interposed resilient ring or tire, an oscillating carrier for said wheels, a device capable of vertical displacement to which the wheel carrier is connected, and resilient means between the vertically moving device and the underside of the vehicle.

15. In means for arresting sidewise movement of a road vehicle, the combination with the carrying wheels, of a subsidiary wheel, comprising outer metal rims or disks and an interposed resilient ring or tire, an oscillating carrier for said wheel, a device capable of vertical displacement to which the wheel carrier is connected, antifriction rollers between the wheel and the carrier, and resilient means between the vertically moving device and the underside of the vehicle.

16. In means for arresting sidewise movement of a road vehicle, the combination with the carrying wheels, of a subsidiary wheel comprising outer metal rims or disks and an interposed compressible ring or tire, a carrying fork for said wheel, a box to which the fork is connected by a hinge pin arranged longitudinally of the vehicle, a bracket secured to the axle of the vehicle within which the box aforesaid is mounted to slide vertically, springs interposed between the box and bracket, stops formed in the box for limiting the extent to which the wheel carrying fork can be oscillated, and anti-friction rollers between the sides of the subsidiary wheel and fork for reducing stress upon the wheel axle when the wheel is running on edge.

Signed at London England this 8th day of January 1907.

WILLIAM ERNEST MONRO.

Witnesses:

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H. GORDON LEIGH.