

N<sup>o</sup> 3023



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Complete Specification Left, 12th Nov., 1901—Accepted, 6th Feb., 1902

PROVISIONAL SPECIFICATION.

**“Improvements in or relating to Brake Mechanisms for Motor Vehicles or the like”.**

I, WILHELM MAYBACH, Engineer, of Cannstatt, Kingdom of Württemberg in the Empire of Germany, do hereby declare the nature of this invention to be as follows:

5 This invention relates to improvements in brake mechanism for motor vehicles or the like and has for its object to provide a brake so constructed that it will be equally effective whether the vehicle is running either in a forward or backward direction.

10 The form of brake employed in brake mechanism constructed according to this invention is a split ring adapted to be expanded to engage the interior of an annular braking surface. The annular braking surface is secured to one of the driving wheels of the vehicle and may conveniently be employed to serve as the means by which the driving power is transmitted to the wheel.

15 The road wheel rotates upon a fixed driving axle and on this driving axle is secured a spider having rollers mounted at the extremities of its arms. The spider is arranged within the annular braking surface and serves to carry the brake-ring when disengaged from the braking surface. Pivoted to the axle is a bell crank lever, one end of which is connected to the mechanism for operating the brake and the other end by two links to the extremities of the brake-ring.

20 The arm of the bell crank lever pivoted to the extremities of the brake ring is so situated that the movement at the end of the arm is practically radial to the brake ring so that when moved towards the brake-ring the extremities of the ring are separated by the connecting links and the ring expanded and when moved away from the ring the extremities drawn together and the ring withdrawn from the braking surface.

25 To prevent the brake-ring from revolving with the rotating braking surface one or more stays or tie rods are secured to it at any convenient point or points their free ends being rigidly secured to some convenient part of the vehicle frame.

30 It is found with this form of brake that according to the direction of rotation of the braking surface one of the extremities of the brake-ring will often bind with the braking surface whilst the other chatters. To prevent this or as an alternative to the above construction, the end of the arm of the bell crank lever which is connected with the extremities of the brake-ring by links as described above may be provided with a wedge-shaped member in place of the links, adapted to be driven between the extremities of the brake-ring, to expand the ring when it is desired that the brake should be applied.

Dated this 12th day of February 1901.

40 BOULT, WADE & KILBURN  
Agents for the Applicant.

*Improvements in or relating to Brake Mechanisms for Motor Vehicles or the like.*

## COMPLETE SPECIFICATION.

**Improvements in or relating to Brake Mechanisms for Motor Vehicles or the like**

I, WILHELM MAYBACH, Engineer, of Cannstatt, in the Kingdom of Wurtemberg, German Empire, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to improvements in brake mechanism for motor vehicles or the like and has for its object to provide a brake so constructed that it will be equally effective whether the vehicle is running either in a forward or backward direction. 5

The form of brake employed in brake mechanism constructed according to this invention is a split ring adapted to be expanded to engage the interior of an annular braking surface. The annular braking surface is secured to one of the driving wheels of the vehicle and may conveniently be employed to serve as the means by which the driving power is transmitted to the wheel. 10

The road wheel rotates upon a fixed driving axle and on this driving axle is secured a spider piece having rollers mounted at the extremities of its arms. The spider piece is arranged within the annular braking surface and serves to carry the brake-ring when disengaged from the braking surface. Pivoted to the axle is a bell crank lever, one end of which is connected to the mechanism for operating the brake and the other end by two links to the extremities of the brake-ring. 15 20

The arm of the bell crank lever pivoted to the extremities of the brake ring is so situated that the movement at the end of the arm is practically radial to the brake ring so that when moved towards the brake-ring the extremities of the ring are separated by the connecting links and the ring expanded and when moved away from the ring the extremities drawn together and the ring withdrawn from the braking surface. 25

To prevent the brake-ring from revolving with the rotating braking surface one or more stays or tie rods are secured to it at any convenient point or points their free ends being rigidly secured to some convenient part of the vehicle frame. 30

It is found with this form of brake that according to the direction of rotation of the braking surface one of the extremities of the brake-ring will often bind with the braking surface whilst the other chatters. To prevent this or as an alternative to the above construction the end of the arm of the bell crank lever which is connected with the extremities of the brake-ring by links as described above may be provided with a wedge-shaped member in place of the links adapted to be driven between the extremities of the brake-ring, to expand the ring when it is desired that the brake should be applied. 35

In the accompanying drawings,

Figure 1 is a central vertical section through a brake mechanism constructed according to this invention: 40

Figure 2 is an elevation of the same viewed from the left of Figure 1;

Figure 2<sup>a</sup> illustrates a detail of the modified construction and

Figure 3 is a plan of the brake mechanism.

Like letters indicate like parts throughout the drawings. 45

The road wheel *a* which runs upon a stationary axle *a*<sup>1</sup> is provided with an annulus *a*<sup>2</sup>. The annulus conveniently carries teeth so that it may be driven by a chain, or may be shaped to serve as a pulley for driving by belt or other

*Improvements in or relating to Brake Mechanisms for Motor Vehicles or the like.*

means. Within the annulus is mounted a split friction ring *b* having a lug *c* by means of which it is secured by a tie rod *d* to the frame of the vehicle at *e*.

To expand the ring *b* an operating rod *f* is provided secured to a bell crank lever *g* pivotted to a support or hanger *h* on the stationary axle *a*<sup>1</sup>. On the free arm of the bell crank lever *g* a link *k* is pivotted at *i* and the free end of the link is connected by means of a toggle joint *l m* to the two ends of the split ring *b*.

To expand the ring *b* and thus apply the brake the operating rod *f* is moved in the direction indicated by the arrow so that the link *k* is depressed and forces the two ends of the split ring apart by means of the toggle joint *l m*. Rotation of the friction ring is prevented by the tie rod *d*, secured to the frame at *e* as described above and as this rod may be made sufficiently rigid to sustain compression as well as longitudinal tension the brake will operate with equal efficiency whether the vehicle is running in a forward or backward direction.

Secured to the axle *a*<sup>1</sup> and within the annulus *a*<sup>2</sup>, a spider piece *n* is mounted, the arms of which are provided with rollers *n*<sup>1</sup> adapted to engage a groove on the inner circumference of the friction ring *b*. When the ring is not in use and is allowed to contract it is carried by the rollers on the spider piece and is thus kept free from the wall of the annulus so that noise caused by frictioning of the two parts, when the brake is not in use is avoided.

Modifications may obviously be made in this apparatus, for instance the link *k* may be rounded at its end and adapted to co-operate with suitably formed end pieces on the split ring *b*, as shown in Figure 2<sup>a</sup>, so that the brake is applied by wedging the end of the link *k* between the opposing ends of the ring, in place of forcing the ends apart by means of a toggle joint. This modified construction is often preferred as, when a toggle joint is employed to operate the friction ring, one side or other, according to the direction of rotation of the annulus, is often found to be more or less inoperative as soon as any of the parts become slightly worn.

In place of the tie rod *d* a pin may project from the lug *c* and engage a slot in the frame of the vehicle to prevent the friction ring from rotating; or a second tie rod may be applied on the opposite side of the wheel so that the rod *d* may not have to sustain compression.

The rollers *n*<sup>1</sup> on the arms of the spider piece *n*, can if desired, be omitted the ends of the arms themselves being adapted to engage and carry the friction ring *b*.

Having now particularly described and ascertained the nature of this invention and in what manner the same is to be performed I declare that what I claim is:—

1. In a brake mechanism the combination with an annulus such as *a*<sup>2</sup> on the road wheel of the vehicle having a split friction ring *b* within it of a rigid support such as *n* secured to the stationary axle of the road wheel to receive the friction ring when not expanded against the walls of the annulus, means for expanding the ring *b* and a connection between the ring and the frame of the vehicle to prevent rotation of the former substantially as described.

2. The complete braking device substantially as described and illustrated in the accompanying drawings.

Dated this 1th day of Novr. 1901.

BOULT, WADE & KILBURN  
Agents for the Applicant.

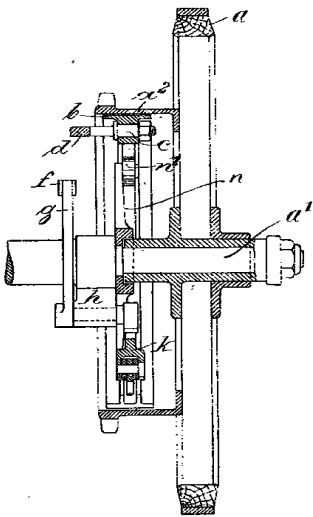


Fig. 1

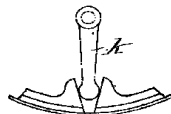


Fig. 2

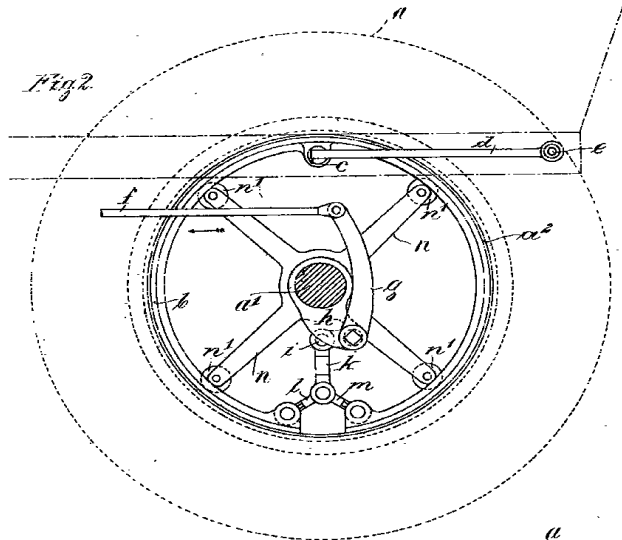


Fig. 3

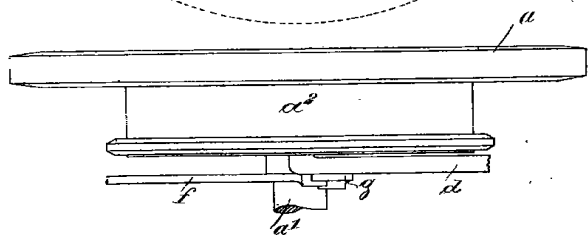
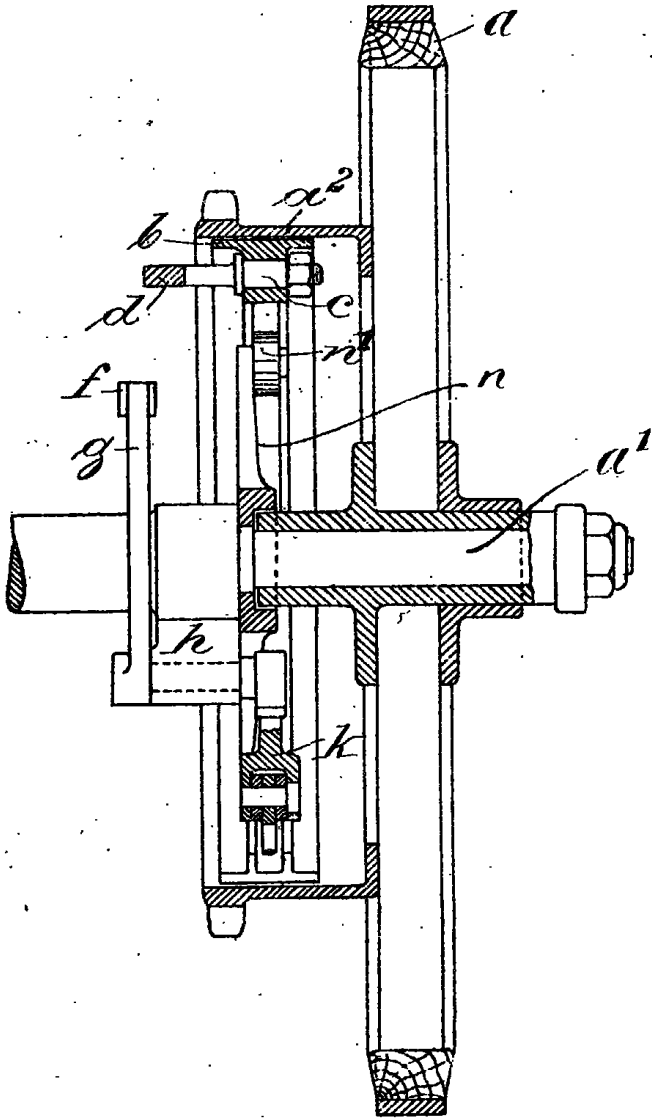


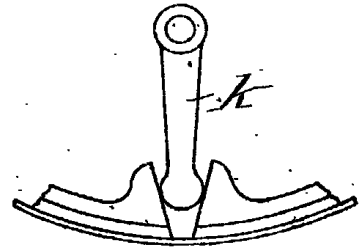
Fig. 4

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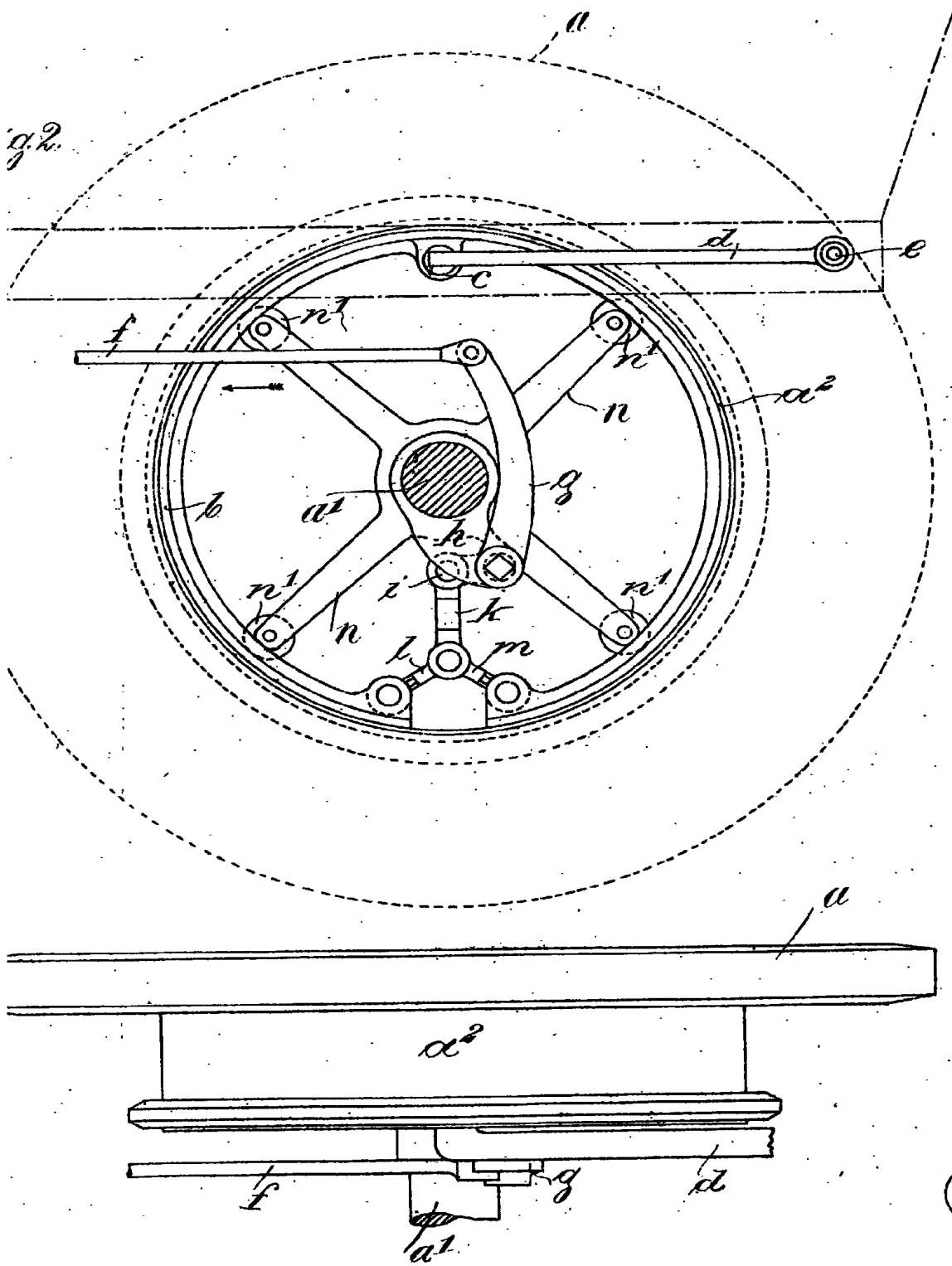


*Fig. 1.*



*Fig. 2.*

*Fig. 3.*



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