

No. 646,982.

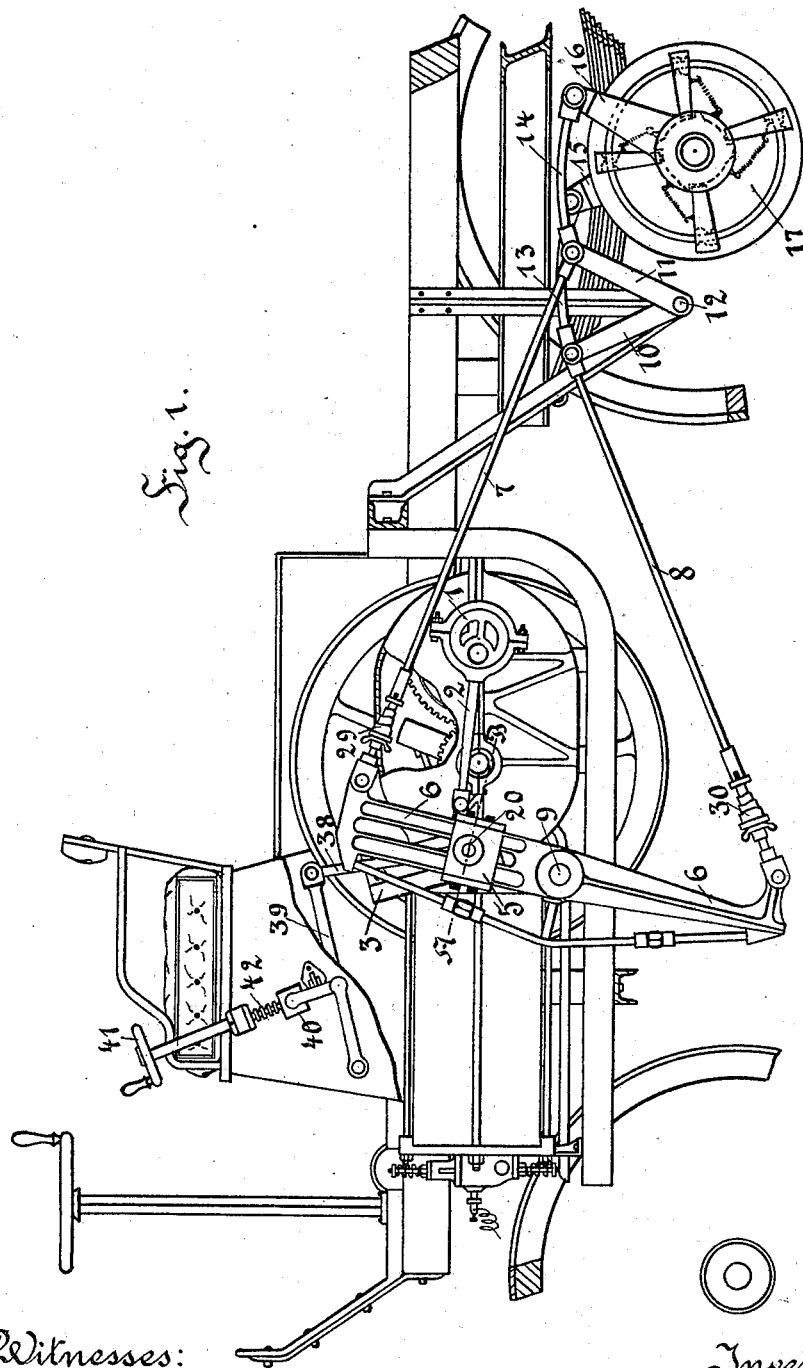
Patented Apr. 10, 1900.

R. HAGEN.  
MOTOR VEHICLE.

(No Model.)

(Application filed Nov. 9, 1899.)

2 Sheets—Sheet 1.



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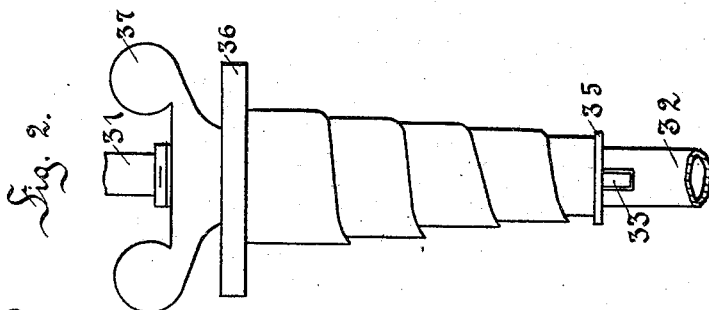
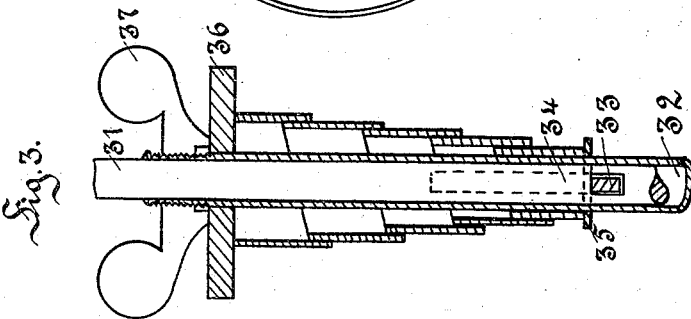
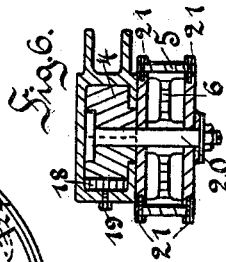
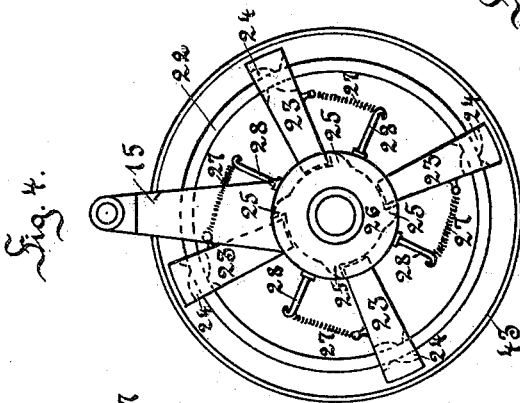
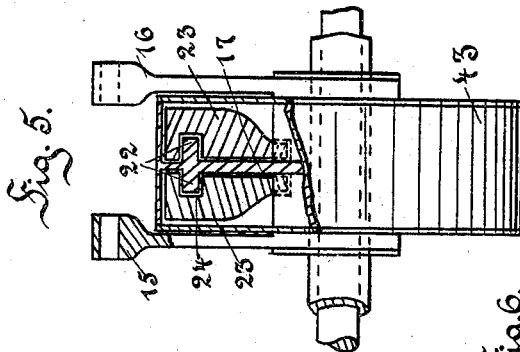
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# UNITED STATES PATENT OFFICE.

RUDOLF HAGEN, OF COLOGNE, GERMANY.

## MOTOR-VEHICLE.

SPECIFICATION forming part of Letters Patent No. 646,982, dated April 10, 1900.

Application filed November 9, 1899. Serial No. 736,445. (No model.)

*To all whom it may concern:*

Be it known that I, RUDOLF HAGEN, a subject of the King of Prussia, German Emperor, residing at Cologne, in the Province of the Rhine, Kingdom of Prussia, German Empire, have invented new and useful Improvements in Motor-Vehicles, of which the following is a specification.

My invention relates to improvements in motor-vehicles in which the rotation of the motor is transferred to the axle of the vehicle by means of a lever mechanism and comprises specially means for effecting a smooth and even running of the vehicles. I attain this object by means of the mechanisms illustrated in the accompanying drawings, in which—

Figure 1 is a side view of the entire mechanism. Fig. 2 is a view of the spring situated in the connecting-rods which transfer the movement of the rocking beam to the clutch mechanism. Fig. 3 is a vertical section of the same. Fig. 4 is a vertical section of the clutch mechanism. Fig. 5 is a horizontal section of the clutch mechanism, while the lower part is a view of the same. Fig. 6 is a section on line A B of Fig. 1.

Similar numerals refer to similar parts throughout the several views.

The movement of the motor is transferred by means of an eccentric 1 and of a connecting-rod 2 to the vertically-oscillating slotted lever 3. In the slot of this slotted lever 3 slides the block 4, Fig. 6, that is pivotally connected with a slide-block 5. The latter slides around the slotted arm of a rocking beam 6, the ends of which are linked to the rods 7 and 8, so that when the lever 3 oscillates the beam 6, which turns around, the axle 9 oscillates also, and the rods 7 and 8 alternately move the levers 10 and 11, fulcrumed at 12. The movement of these levers is transferred by means of the connecting-rods 13 and 14 and the levers 15 and 16 to the driving-disk 17.

By means of the arrangement of the levers 10 and 11 it is attained that the movement of the rocking beam 6 is transferred to the levers 15 and 16 of the clutch mechanism always in the same horizontal direction, which is very important, as in case the movement of the rocking beam would be transferred di-

rectly to the levers 15 and 16 a compressing of the wheel-spring of the vehicle would take place as soon as the upper arm of the rocking beam begins to draw, which compressing would cease as soon as the lower arm of the rocking beam begins to draw, whereby a continually up-and-down motion of the platform of the vehicle would arise. By the arrangement of the levers 10 and 11 this drawback is entirely overcome.

In order to overcome the wearing out of the slide-blocks 4 and 5, the slot of the lever 3 is provided with a steel plate 18, Fig. 6, which, by means of head-screws 19, can be tightened. The wearing out of the block 4 around the pivot-bolt 20 is dispensed with by dividing the block in two halves, leaving a small slot between each other. If the bolt 20 gets loose, the screws 19 are tightened, whereby the two halves of the block 4 are pressed nearer together, so that the bolt is fastened again.

The slide-block 5 consists of four plates surrounding the rocking beam 6 and can be easily tightened by tightening the screws 21, connecting these four plates.

The driving-disk 17, detailed in Figs. 4 and 5, is rigidly attached to the driving-axle of the vehicle. It is provided with an annular projection 22 on either side, along which the clutches 23 are adapted to slide by means of their grooves 24. The interior ends of the clutches 23 are seized by the corresponding noses 25 of a ratchet 26, connected with the lever 15, as soon as the lever 15 is moved in that direction in which the driving-axle is to be rotated. As soon as the noses 25 push against the interior ends of the corresponding clutches 23 the latter turn around that part of the annular projection 22 which lies within the groove 24 in such a manner that a strong friction arises between the clutches and the annular projection, and in consequence the driving-disk 17 will be rotated. When the lever 15 is moved in the reverse direction, the springs 27, fastened to the pins 28 and to the corresponding clutches, respectively, will withdraw the clutches, which then can freely slide along the annular projection as they are seized by the springs near to the said projection. Of course the said projection, the lever, clutches, noses, and

springs are provided on either side of the disk 17. It is obvious that a continual rotation of the disk 17 will take place as the levers 15 and 16 act alternately upon the clutches. 5 The wearing out of the clutches 23, as well as of the annular projection 22, is prevented by surrounding the whole mechanism with a tight box 43, which is partially to be filled with oil.

10 In order to overcome the dead-point lying between the end of the stroke of one of the levers 15 and 16 and the beginning of the stroke of the other lever, and thereby rendering the running of the vehicle smoother and 15 even, springs 29 and 30 are provided within the connecting-rods 7 and 8. These springs, the construction of which is shown in Figs. 2 and 3, take up a part of the power transferred to the clutch mechanism by means of 20 the connecting-rods 7 and 8 and give this power away in the moment of the dead-point, so that a continual rotating without any dead-point takes place. The construction of the springs 29 and 30 may be different, but it has 25 proved advantageous to use the construction shown in Figs. 2 and 3. In this construction the connecting-rods 7 and 8 consist of a bar 31 and a pipe 32. The bar 31 is provided with a bolt 33, which slides into opposite slots 34 30 of the pipe 32, and thereby moves a washer 35. Between this washer 35 and another washer 36 the spring proper is situated. The washer 36 is held in its position and can be screwed down by means of a wing-nut 37. By 35 this means the strength of the spring can be regulated.

In order to be able to change the speed of the vehicle, the following arrangement is provided: The two connected slide-blocks 4 and 40 5 are by means of the connecting-rods 38, Fig. 1, fixed to their common pivot-bolt 20, connected with the lever 39. This lever is connected with a nut 40, which by means of a hand-wheel 41, attached to the screw 42, can 45 be screwed up and down, so that by turning the hand-wheel 41 the blocks 4 and 5 can be dislocated within their slots. By dislocating the slide-block 4 within the slotted lever 3 the effective length of the latter is diminished 50 or increased. As the slide-block 4 is connected with the slide-block 5, the latter is removed, together with the block 4, and the effective length of the upper arm of the beam 6 is correspondingly changed. If the blocks 55 4 and 5 are pushed up, the effective length of the lever 3 is diminished, while that of the beam 6 is increased, whereby a double diminution of the stroke of the driving-beam and a decrease of the velocity of the vehicle are 60 attained. By pushing the slide-blocks down the speed of the vehicle is increased.

The stroke of the beam 6 may be increased to the maximum or diminished to zero—i. e., to the complete stoppage of the vehicle, although the motor continues its rotation. 65 For the latter purpose the slot of the lever 3 is extended beyond its pivot, so as to permit it

to bring the slide-block 4 in a position in which its pivot is coincident with the pivot of the lever 3. In this position of the slide- 70 block 4 the oscillation of the lever 3 is no more transmitted to the beam 6.

I am aware that prior to my invention motor-vehicles driven by means of lever mechanisms in conjunction with clutch mechanisms have been constructed. I therefore do not claim such combination, broadly; but 75

What I claim as my invention, and desire to secure by Letters Patent of the United States, is— 80

1. In motor-vehicles the combination with a slotted lever 3 operated by means of an eccentric 1 and a connecting-rod 2 from the main shaft of the motor, a rocking beam 6 85 the one arm of which is slotted, two slide-blocks 4 and 5 sliding in the slots above mentioned and connected to each other by means of a pivot-bolt 20 stiff connecting-rods 7 and 8 for transmitting the motion of the rocking beam 6 to a clutch mechanism, a clutch mechanism for transmitting the motion of these 90 connecting-rods to the axle of the vehicle, of two levers the pivot of which is inflexibly connected with the platform of the vehicle, said levers being connected with the beam 95 by means of the stiff rods mentioned above and to the levers 15 and 16 driving the clutch mechanism by means of small connecting-rods 13 and 14 as and for the purpose set forth.

2. In motor-vehicles the combination with 100 a slotted lever 3 operated by means of an eccentric 1 and a connecting-rod 2 from the main shaft of the motor, a rocking beam 6 the one arm of which is slotted, two slide- 105 blocks 4 and 5 sliding in the slots above mentioned and connected to each other by means of a pivot-bolt 20 stiff connecting-rods 7 and 8 for transmitting the motion of the rocking beam 6 to small levers 10 and 11 adapted to 110 transfer this movement to a clutch mechanism, a clutch mechanism for transmitting the movement of said levers to the axle of the vehicle, of springs 29 and 30 situated in the 115 connecting-rods 7 and 8 and adapted to overcome the dead-point in the forward and backward motion of the beam 6 as and for the purpose set forth.

3. In motor-vehicles the combination with a slotted lever 3 operated by means of an eccentric 1 and a connecting-rod 2 from the 120 main shaft of the motor, a rocking beam 6 the one arm of which is slotted, two slide-blocks 4 and 5 sliding in the slots above mentioned and connected to each other by means of a pivot-bolt 20 stiff connecting-rods 7 and 125 8 for transmitting the motion of the rocking beam 6 to small levers 10 and 11 adapted to transfer this movement to a clutch mechanism, a clutch mechanism for transmitting the movement of said levers to the axle of 130 the vehicle, of springs 29 and 30 situated in the connecting-rods 7 and 8 and adapted to overcome the dead-point in the forward and backward motion of the beam 6 and means

for regulating the strength of said springs by means of wing-nuts as and for the purpose set forth.

4. In motor-vehicles the combination with  
5 a slotted lever 3 operated by means of an eccentric 1 and a connecting-rod 2 from the main shaft of the motor, a rocking beam 6 the one arm of which is slotted, two slide-blocks 4 and 5 sliding in the slots above mentioned and connected to each other by means  
10 of a pivot-bolt 20 means for tightening said slide-blocks as well as the pivot-bolt 20 in case they are worn out, stiff connecting-rods 7 and 8 for transmitting the motion of the  
15 rocking beam 6 to small levers 10 and 11 adapted to transfer this movement to a clutch

mechanism, a clutch mechanism for transmitting the movement of said levers to the axle of the vehicle, of springs 29 and 30 situated in the connecting-rods 7 and 8 and adapted to overcome the dead-point in the forward and backward motion of the beam 6 and means for regulating the strength of said springs by means of wing-nuts as and for the purpose set forth.

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

RUDOLF HAGEN.

Witnesses:

MAX WESCHER,  
PAUL WOLLENHAUPT.