A. B. CADMAN.

SPEED INDICATING EQUIPMENT FOR RAILWAY CARS.

APPLICATION FILED OCT. 29, 1907.

1,037,862. Patented Sept. 10, 1912.

3 SHEETS—SHEET 1.

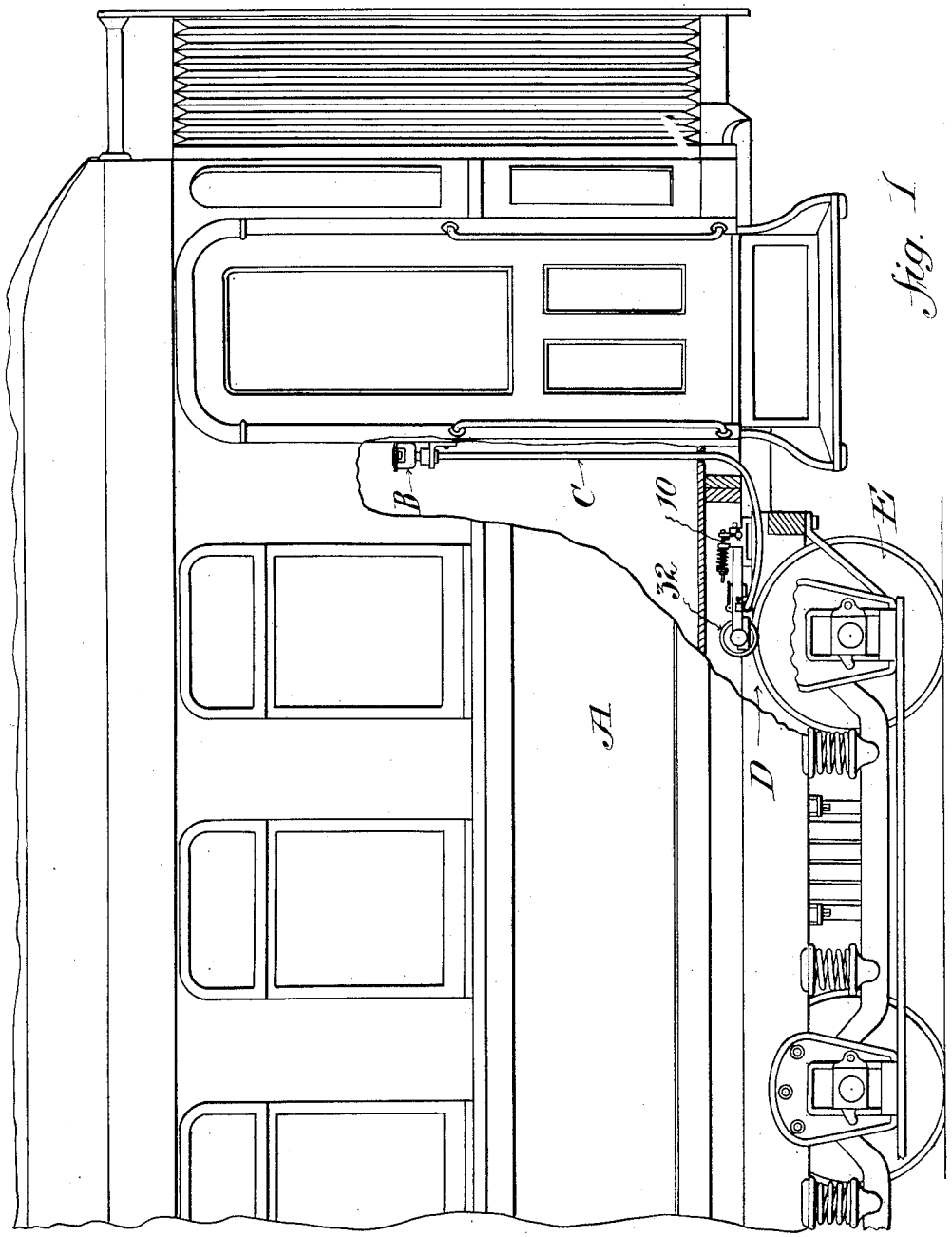

Fig. 1

Witnesses:
C. M. Benjamin
Joseph Klein.

Inventor
Addi Benjamin Cadman
By his Attorney
Samuel E. Darby

A. B. CADMAN.

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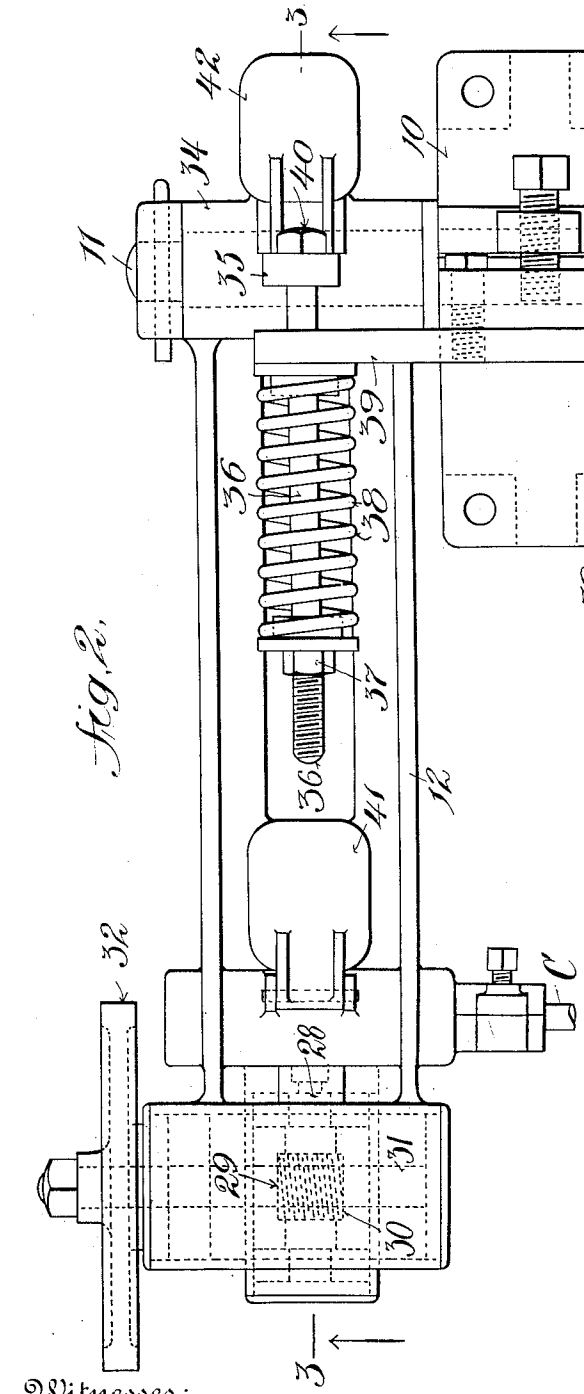

Fig. 2.

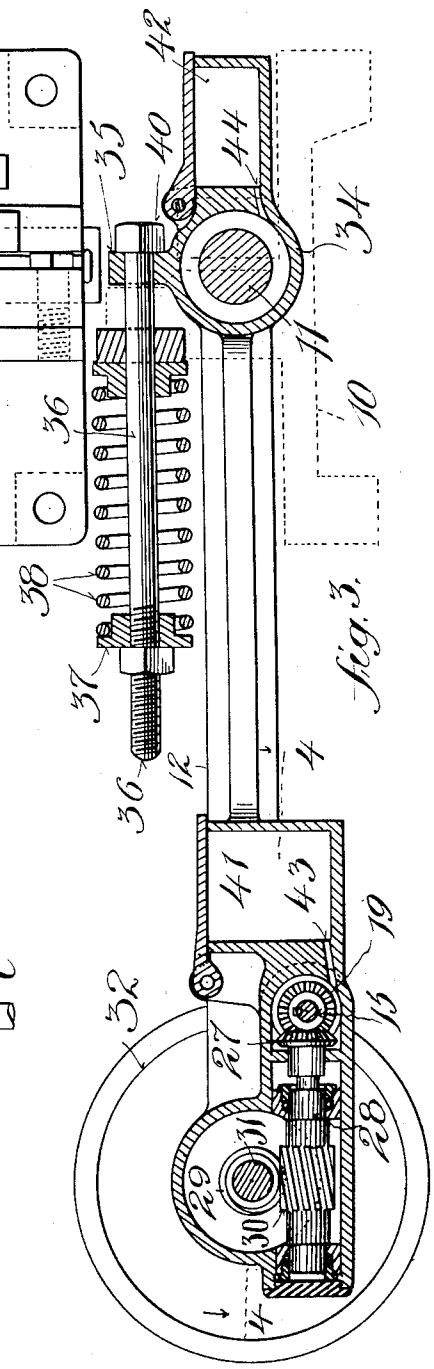

Fig. 3.

Witnesses:
W. W. Benjamin
Joseph Klein.

Inventor
Addi Benjamin Cadman
By his Attorney
Samuel E. Darby

A. B. CADMAN.

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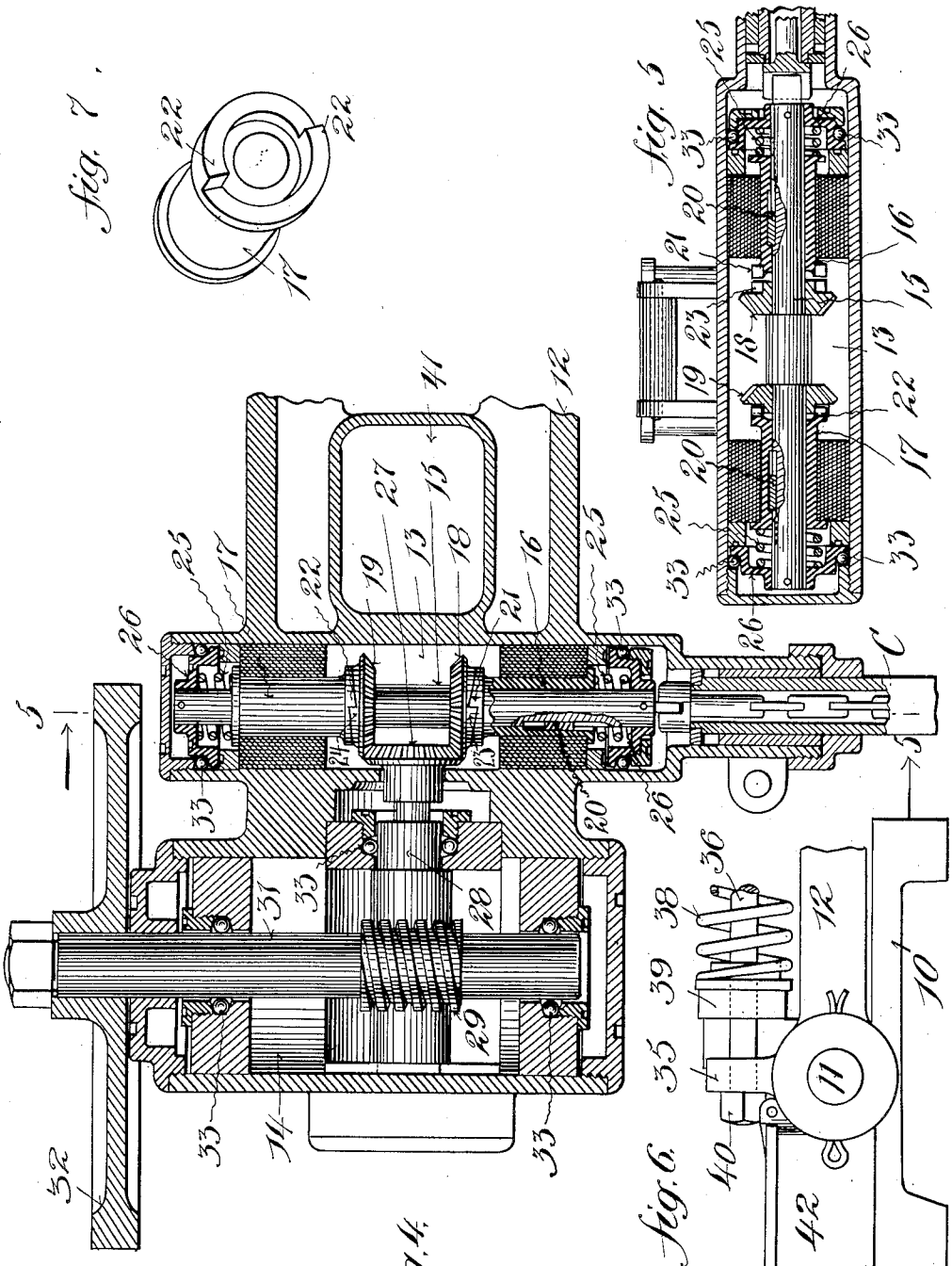

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

Witnesses:
W. Benjamin
Joseph Klein.

Inventor
Addi Benjamin Cadman
By his Attorney
Samuel E. Darby

UNITED STATES PATENT OFFICE.

ADDI BENJAMIN CADMAN, OF BELOIT, WISCONSIN, ASSIGNOR TO WARNER INSTRUMENT COMPANY, OF BELOIT, WISCONSIN, A CORPORATION OF WISCONSIN.

SPEED-INDICATING EQUIPMENT FOR RAILWAY-CARS.

1,037,862. Specification of Letters Patent. Patented Sept. 10, 1912.

Application filed October 29, 1907. Serial No. 399,666.

To all whom it may concern:

Be it known that I, ADDI BENJAMIN CADMAN, a citizen of the United States, and resident of the city of Beloit, county of Rock, State of Wisconsin, have made a certain new and useful Invention in Speed-Indicating Equipments for Railway-Cars, of which the following is a specification.

This invention relates to speed indicating equipments for vehicles, and particularly to apparatus employed for measuring and indicating the speed of railway cars or other moving vehicles.

The object of the invention is to provide an equipment for measuring and indicating the speed of moving vehicles, railway cars and the like which is simple and durable in construction, easily applied and efficient in operation.

A further object of the invention is to provide an apparatus of the class referred to which is driven in continuous direction whether the car or other vehicle moves in one direction or the other.

Other objects of the invention will appear more fully hereinafter.

The invention consists substantially in the construction, combination, location and relative arrangement of parts all as will be more fully hereinafter set forth, as shown in the accompanying drawings, and finally pointed out in the appended claims.

Referring to the accompanying drawings, and to the various views and reference signs appearing thereon Figure 1 is a view in side elevation of a portion of a railway car, parts broken out and parts in section showing the application thereto of a speed measuring and indicating apparatus embodying the principles of my invention. Fig. 2 is a view in plan of the equipment detached the flexible drive shaft for the speed indicator being broken off. Fig. 3 is a view in longitudinal section on the line 3, 3, Fig. 2, looking in the direction of the arrows. Fig. 4 is a view in horizontal section on the line 4, 4, Fig. 3, looking in the direction of the arrows, parts being broken off. Fig. 5 is a broken view in section on the line 5, 5, Fig. 4, looking in the direction of the arrows. Fig. 6 is a broken detail view in side elevation of one end of the device shown in Figs. 2 and 3. Fig. 7 is a detached detail view of a clutch sleeve employed in connection with my invention.

The same part is designated by the same reference sign wherever it occurs throughout the several views.

In the operation of moving vehicles, such, for instance, as railway cars, engines, street cars and the like, it is desirable to provide means for measuring the speed at which the vehicle is going and to indicate such speed to the passengers, engineer, motorman, or other persons on the car or vehicle. It is also desirable to secure accuracy in such speed measurements, even under the rough conditions of usage to which railway cars, street cars and the like are subjected, when operated in service. It is also desirable to provide means for effecting accurate speed measurements and indications thereof whether the vehicle is traveling in one direction or the other, and whatever the speed may be. It is also important that provision be made for the swaying lateral or vertical movements of the vehicle when operated under service conditions, and that the apparatus employed be simple, economical to manufacture and easily and readily applied to or removed from the vehicle and without interfering or being interfered with the running gear of the vehicle. To the attainment of these various objects and purposes my present invention is specially directed, and in carrying out my invention I propose to employ a speed measuring and indicating instrument which is located on the car or other vehicle in position to be readily seen and inspected by the passenger, motorman, engineer or other person desiring to see or inspect the same, and I propose to drive such instrument through flexible or other form of transmitting gear from some convenient rotating part of the running gear, and I propose to provide a construction of drive gearing in simple and compact form and of such relation that the speed measuring or indicating instrument will be driven in continuous direction whatever may be the direction of travel of the car, and the whole of such drive gearing is arranged in

the form of an attachment which can be readily and easily applied to the truck frame, for instance, of a railway car, and in convenient relation to be driven from, say, the truck wheel.

Referring to the drawings, reference sign A, designates a railway car, and B, a speed measuring or indicating instrument arranged within the same, and in any suitable or convenient manner where it can be readily inspected by a passenger on the car.

C, designates a flexible shaft for driving the speed measuring or indicating device, said shaft extending to and being driven by the drive gearing presently to be described.

The attachment comprises a supporting block or casting 10, adapted to be mounted upon and bolted or otherwise secured to a truck frame beam D, or other convenient part of the car truck. A pin or bolt 11, is mounted in and secured to said block or casting 10, and extends laterally therefrom to form a support upon which a frame 12 is sleeved to rock or swing. In the free end of the frame 12, are formed the transverse chambers 13, 14. In the chamber 13, is journaled a shaft 15, upon the respective ends of which are mounted sleeves 16, 17, said sleeves being splined or keyed to rotate with said shaft, as indicated at 20, Figs. 4 and 5, but capable of endwise movement thereon. Also mounted on shaft 15, are the oppositely presented bevel gears 18, 19, said gears being loose upon said shaft. The inner or proximate ends of the sleeves 16, 17, are respectively provided with clutch teeth 21, 22, adapted to coöperate with similar clutch teeth 23, 24 on the hub faces of the bevel gears 18, 19. The coöperating clutch teeth 21, 23, of one gear and sleeve are reversely arranged with respect to the clutch teeth 22, 24, of the other gear and sleeve. From this description it will be seen that when either of said gears rotates in one direction it will become clutched to its coöperating sleeve to rotate the shaft 15, but when said gear is rotated in the opposite direction the coöperating gear and sleeve clutch teeth will ride over or past each other without becoming clutched together and without imparting a corresponding rotative movement to the shaft 15. To permit this operation the sleeves, as above indicated are mounted for endwise movement upon shaft 15, while being splined or keyed thereto, and consequently means are provided for yieldingly maintaining the sleeves pressed endwise against the gear hub faces. In the construction shown this result is accomplished by interposing a spring 25, between a cap 26 carried at each end of the shaft 15, and the outer end of the adjacent sleeve. The springs 25, constantly, but yieldingly press said sleeves endwise toward each other and into position for the gear and sleeve clutch teeth to engage with each other.

While I have shown and described one form of clutch mechanism having the relation and performing the function stated, it is to be understood that my invention is not to be limited or restricted to the exact construction shown and described as other constructions, forms and arrangements of clutch devices may be equally well adapted for use in connection with my invention.

Intermeshing with both the oppositely presented bevel gears 18, 19, is a gear 27, carried upon a countershaft 28, arranged in longitudinal relation, with respect to the frame 12, and journaled to rotate therein, said shaft being driven through suitable speed reduction gears 29, 30, such, for instance as worm gearing, from a shaft 31, journaled in the chamber 14, and having one end extending through the end of said chamber and carrying a drive wheel 32 on such extending end. In practice, and in order to reduce friction I journal the shafts 15, 28 and 31, upon roller or ball bearings, as indicated at 33.

In practice I so mount and arrange the supporting block or casting 12, upon the truck frame that the drive wheel 32, will be brought to bear upon some convenient revolving part of the running gear. In the form shown, though in this respect my invention is not to be limited or restricted the drive gear is arranged to bear upon the peripheral or tread surface of the truck wheel E, as clearly shown in Fig. 1. Any suitable or convenient means may be employed for maintaining the proper degree of contact pressure of the drive wheel 32 upon the truck wheels E. I have shown a simple construction for accomplishing this result wherein the sleeve 34 of the frame 12 which forms a pivot bearing on the pin 11, is provided with a lug 35, through which extends a rod 36, carrying a nut 37, upon the threaded end thereof. A coil spring 38, is interposed between this nut 37 and a flange 39, carried by the block or casting 10. The tension of spring 38, is exerted upon the nut 37, tending to press the rod 36, endwise in a direction for the head 40, thereon to engage the lug 35, and rock the frame 12, to press the wheel 32, into efficient driving and bearing contact with the tread of the truck wheel, while at the same time permitting a yielding movement of said wheel and frame in the opposite direction. The tension of said spring 38, may be adjusted by turning up or backing off the nut 37.

If desired, and in order to efficiently lubricate the bevel gearing, and also the bearing of the sleeve 34, upon the pivot pin 11, I provide the frame 12 with oil chambers 41, 42, adapted to receive a suitable lubricant, such oil chambers respectively

communicating through passages 43, 44, with the gear chamber 13, and the bore of sleeve 34.

The flexible or other transmitting shaft or gear C, is suitably connected to the gear shaft 15 to be driven thereby, as most clearly shown in Figs. 4 and 5.

The operation is very simple and will be readily understood. The wheel 32 bears upon the tread surface of the truck wheel and is driven thereby. The rotations thus imparted to shaft 31 are transmitted through the speed reduction gears 30 and 29, and countershaft 28, to the bevel gear 27, which, intermeshing with both bevel gears 18, 19, drives said gears in opposite directions, one of said bevel gears 18, 19, being clutched to its coöperating sleeve, thereby driving the shaft 15, and, hence also the transmitting gear or shaft C, and the speed indicating instrument B, on the car, while the other of said bevel gears 19 or 18, rides idly over the clutch teeth of its sleeve. When, however, the wheel 32 is driven in the opposite direction, the previously loose bevel gear 18 or 19, becomes clutched or coupled to its sleeve and hence drives the shaft 15 and the instrument B, while the previously clutched bevel gear now runs loose. Thus the shaft 15, and hence, also the instrument B, is driven in constant or continuous direction whichever may be the direction in which the car may be operated.

From the foregoing description it will be seen that I provide an exceedingly simple and efficient apparatus for the purposes set forth, which is strong and durable and capable of withstanding the wear and rough usage to which railway car equipments are subjected in service operation. It will also be seen that I provide an attachment which can be readily applied to a railway truck or detached therefrom, and which does not interfere with the proper operation of the car running gear and requires no special construction of such running gear, but can be easily and readily applied to any ordinary car truck.

In the use of any attachment embodying the principles of my invention, passengers in a passenger car equipped with the apparatus may readily see the exact speed at which the car is traveling at any moment, whether the car is going in one direction or the other. In the case of an engine or a street car motorman's cab equipped with the apparatus, the engineer or motorman can observe his rate of speed at any instant of his run, and hence be able to maintain a uniform speed, make up lost time, or increase or decrease his speed according to the exigencies or requirements of the case, and with knowledge of an absolute measurement and indication of the speed he is making.

While I have shown and described a specific construction embodying the principles of my invention, it is to be understood that my invention is not to be limited or restricted to such specific structure, as changes therein and modifications thereof may readily occur to persons skilled in the art and still fall within the spirit and scope of my invention. But

Having now set forth the object and nature of my invention and a construction embodying the principles thereof, and having described such construction, its purposes, function and mode of operation, what I claim as new and useful, and of my own invention, and desire to secure by Letters Patent is:

1. The combination with a railway car, and its truck frame and wheels, of a supporting block mounted on the truck frame, a casting or bracket carried by said block, and having transversely arranged chambers, a shaft journaled in each chamber, a counter-shaft geared to both of said shafts, one of said first mentioned shafts having a drive wheel, means for pressing said drive wheel into contact with a truck wheel, means whereby the other of said shafts is driven in continuous direction whatever may be the direction of rotation of the drive wheel, and a speed indicating device mounted on the car and actuated by said last mentioned shaft.

2. In an apparatus of the class described, a car and its truck, a supporting casting mounted on the truck, a frame pivotally mounted on said casting, a drive shaft and a driven shaft journaled in said frame, intermediate driving connections between said shafts, means driven by a truck wheel for operating said drive shaft, a speed indicating device mounted on the car, and operated from said driven shaft, and means whereby said driven shaft is operated in continuous direction whatever may be the direction of operation of the drive shaft.

3. In an apparatus of the class described, a supporting casting, a frame pivotally mounted thereon, a drive shaft and a driven shaft journaled in said frame, a countershaft geared to the drive shaft and carrying a bevel gear, oppositely arranged bevel gears loosely mounted on the driven shaft and respectively meshing with the bevel gear on the countershaft, means whereby one or the other of said loosely mounted gears is clutched to said driven shaft according to the direction of rotation of said countershaft, whereby said driven shaft is driven in continuous direction, an operating member carried by said drive shaft, a rotating member therefor, and means for yieldingly and frictionally holding said operating and rotating members in engagement with each other.

4. In an apparatus of the class described, a casting carrying a supporting pin, a frame pivotally mounted on said pin, a driven shaft journaled in said frame and carrying an operating member, oppositely presented gears loosely sleeved on said shaft, a counter-shaft geared to both of said gears, a drive shaft for driving said countershaft, means for clutching one or the other of said loosely sleeved gears to the driven shaft, according to the direction of rotation of the drive and countershafts, a rotating member, and means for yieldingly rocking said frame to frictionally hold said operating member in engagement with said rotating member.

5. In an apparatus of the class described, a casting, a frame pivotally mounted thereon, a driven shaft journaled in said frame and carrying an operating member, sleeves mounted on said shaft to rotate therewith but capable of endwise movement thereon, oppositely presented gears loosely sleeved upon said shaft, clutch teeth respectively connecting said gears and sleeves, said clutch teeth being oppositely arranged, a drive gear interposed between said loosely sleeved gears and meshing therewith, a countershaft carrying said drive gear, a drive shaft and reduction gearing connecting said countershaft and drive shaft, a rotating member, and means for yieldingly rocking said frame to frictionally hold said operating and rotating members in frictional engagement.

6. In an apparatus of the class described, a supporting block having a flange, a pin carried by said block, a casting sleeved upon said pin to rock thereon, and carrying a lug, a rod extending through said lug and flange and carrying a nut, a spring interposed between said nut and flange, a drive shaft, a countershaft and a driven shaft journaled in said casting, a drive wheel carried by said drive shaft, said counter shaft being geared respectively to said drive shaft and driven shaft.

7. In an apparatus of the class described, a casting, a frame pivotally mounted thereon and having transverse chambers, a drive and driven shaft respectively, journaled in said chambers, a counter shaft geared respectively to said drive and driven shafts, means for supplying a lubricant to said driven shaft chamber, an operating member on said drive shaft a rotating member, and means for yieldingly rocking said frame to frictionally hold said operating and rotating members in frictional engagement.

8. The combination with a truck frame and truck wheels, of a casting mounted on the truck frame, a supporting frame movably mounted on said casting, a drive shaft and a driven shaft journaled in said supporting frame, a countershaft geared respectively to said drive and driven shafts, an operating member on said drive shaft and arranged to be driven by a truck wheel for actuating said drive shaft, the gearing connecting said countershaft and driven shaft being constructed and arranged to drive said driven shaft in continuous direction whatever may be the direction of operation of the drive shaft, means for yieldingly moving said supporting frame to hold said operating member in frictional engagement with said truck wheel, and a speed indicating device actuated by said driven shaft.

9. The combination with a truck frame and truck wheels, of a casting mounted on the truck frame, a supporting frame movably mounted on said casting, a drive shaft and a driven shaft journaled in said supporting frame, a wheel carried by said drive shaft, means for yieldingly holding said wheel in frictional engagement with said truck wheel, a counter shaft geared to said drive shaft, gearing intermediate said countershaft and driven shaft for actuating the latter in continuous direction whatever may be the direction of operation of the drive shaft, and a speed indicating device actuated by said driven shaft.

10. The combination with a truck frame and truck wheels, of a casting mounted on the truck frame, a supporting frame pivotally mounted on said casting, a drive shaft and a driven shaft journaled in said supporting frame, a wheel carried by said drive shaft, means for yieldingly rocking said supporting frame to press said wheel frictionally against a truck wheel, a countershaft geared to said drive shaft, gearing intermediate said countershaft and driven shaft for actuating the latter in continuous direction whatever may be the direction of operation of the drive shaft, and a speed indicating device actuated by said driven shaft.

In testimony whereof I have hereunto set my hand in the presence of the subscribing witnesses, on this 22d day of October A. D. 1907.

ADDI BENJAMIN CADMAN.

Witnesses:
A. E. Moon,
Hal Reifenberg.