G. A. DEARDORFF.

ROAD MAP.

APPLICATION FILED MAR. 17, 1915.

1,184,726.

Patented May 30, 1916.

3 SHEETS—SHEET 1.

Fig. 1.

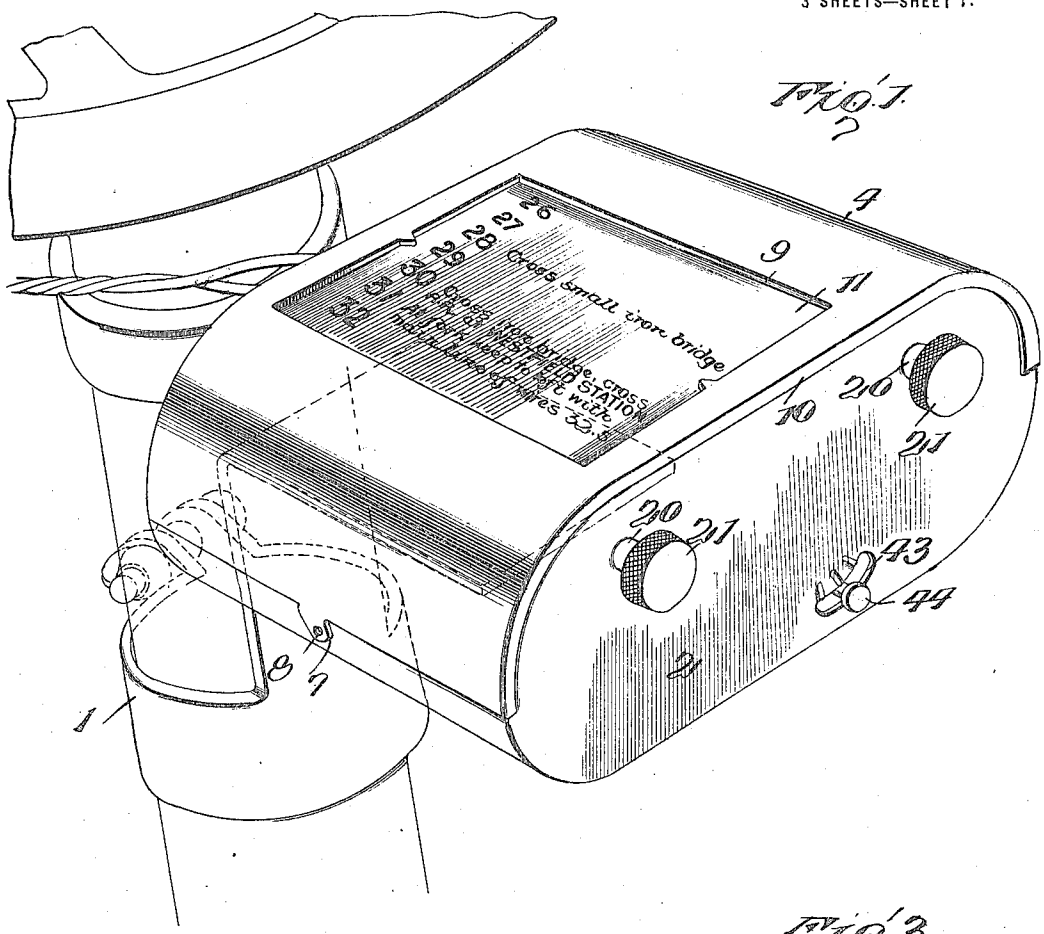
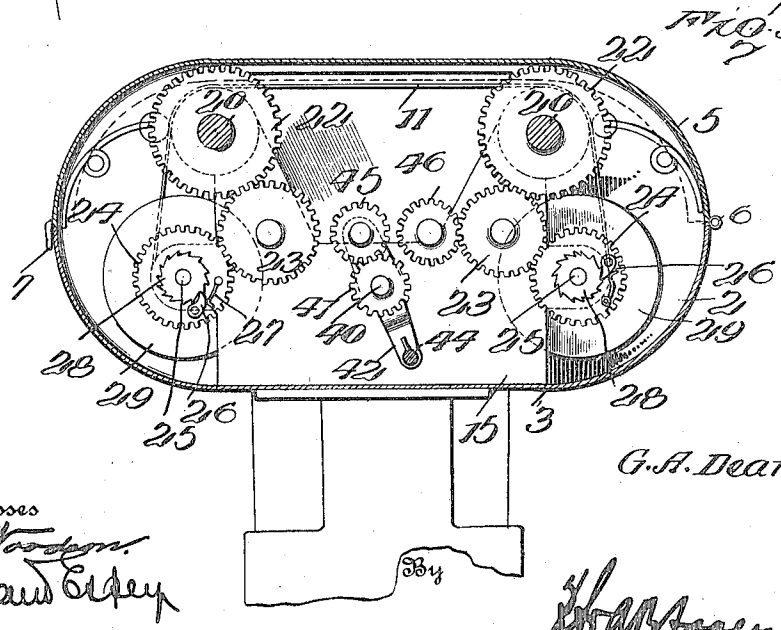


Fig. 3.



Witnesses

Inventor

G. A. Deardorff

By

Attorneys.

G. A. DEARDORFF.

ROAD MAP.

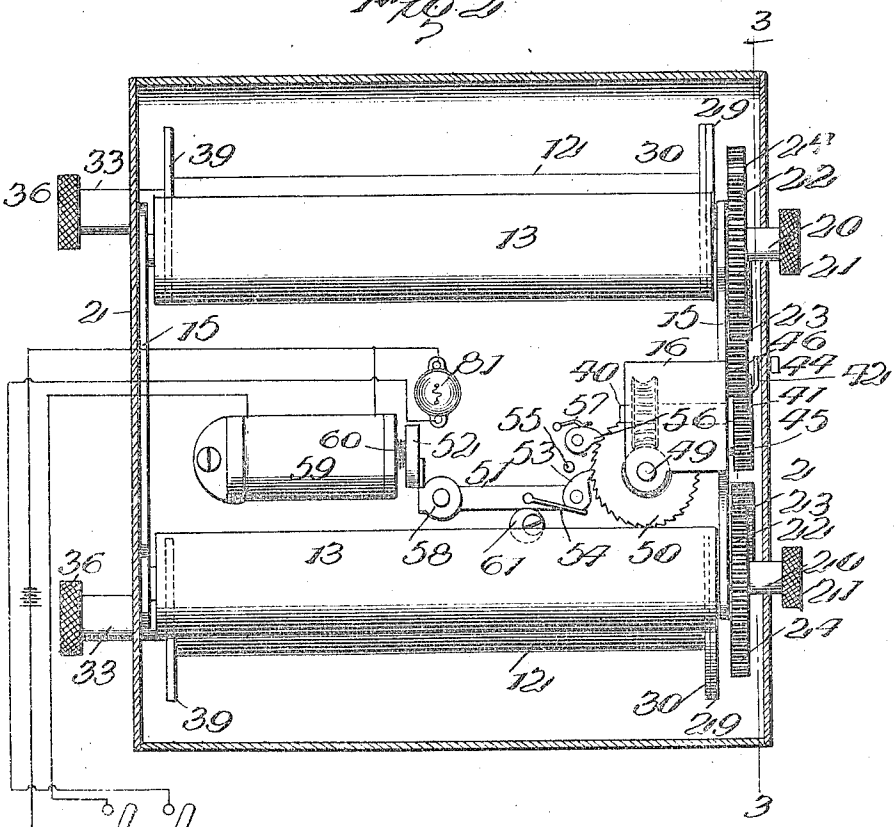
APPLICATION FILED MAR. 17, 1915.

1,184,726.

Patented May 30, 1916.

3 SHEETS—SHEET 2.

Fig. 2.



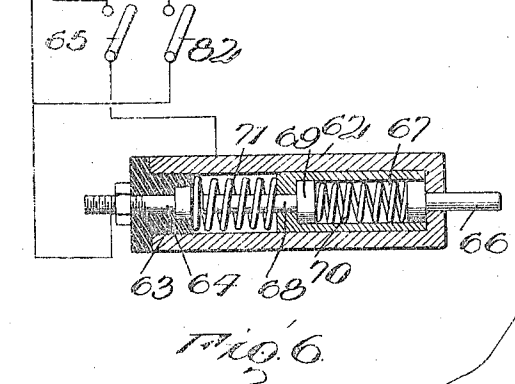
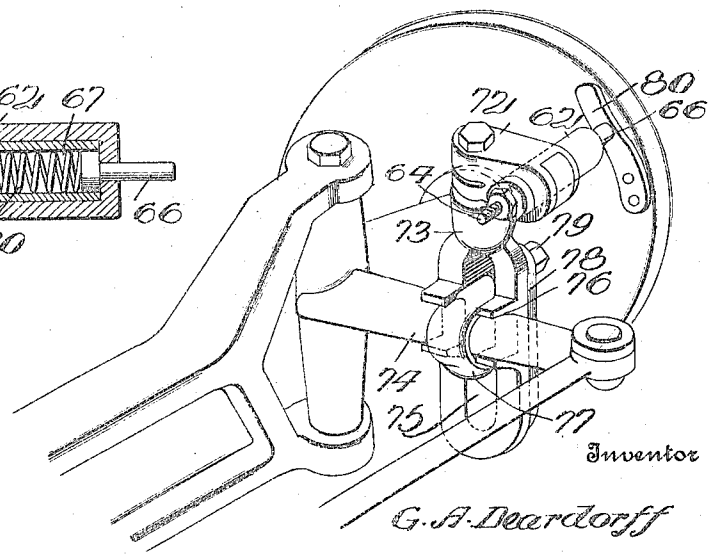


Fig. 6.



Witnesses

H. A. Woodson.

Richard Elfreth

Inventor

G. A. Deardorff

By

Attorneys.

G. A. DEARDORFF.

ROAD MAP.

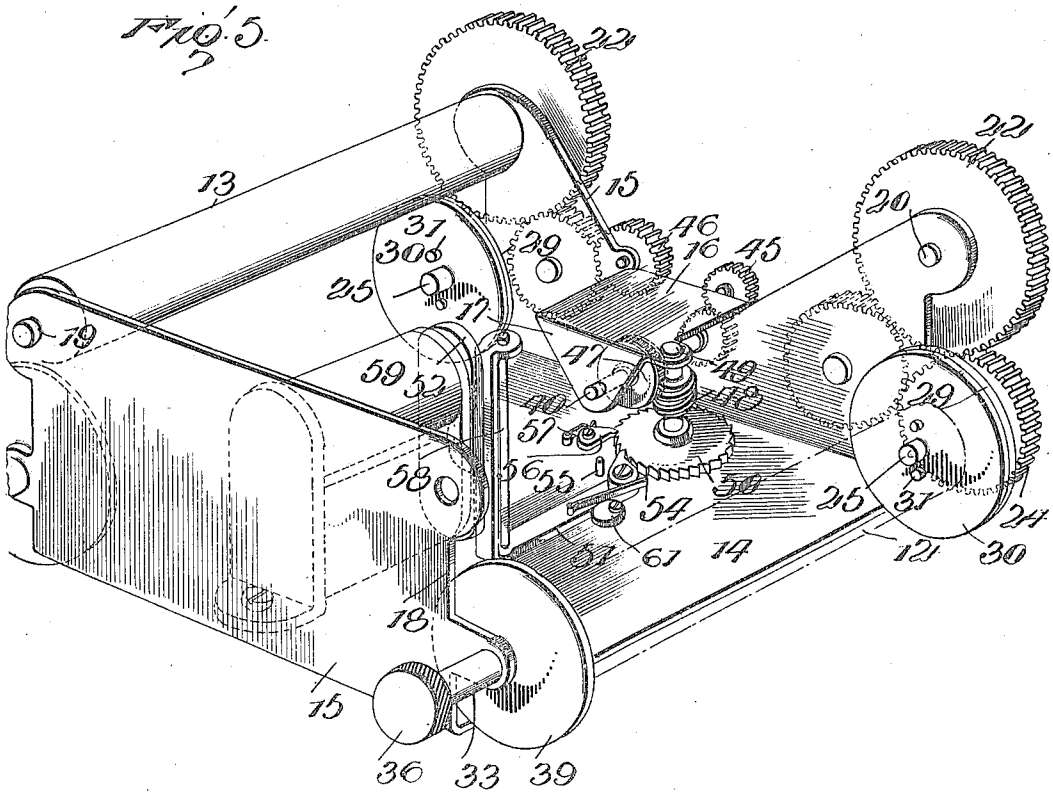
APPLICATION FILED MAR. 17, 1915.

1,184,726.

Patented May 30, 1916.

3 SHEETS—SHEET 3.

FIG. 5.



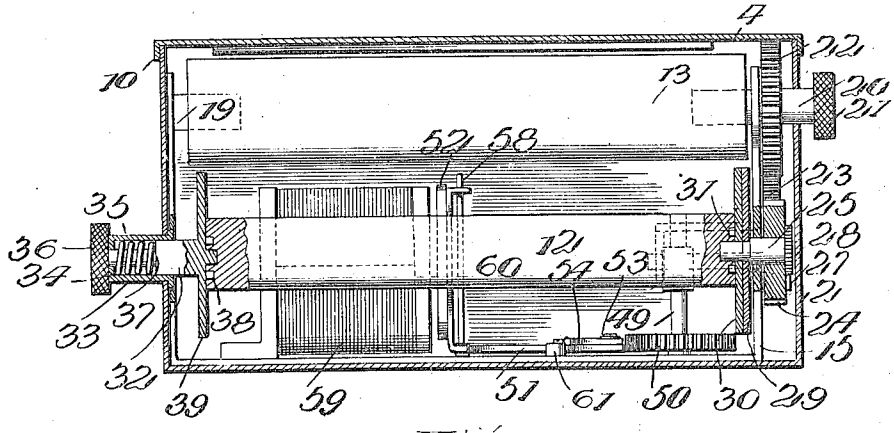


FIG. 4.

Inventor

G. A. Deardorff

Witnesses

W. S. Woodson

Edward Eberly

By

H. W. Mercer

Attorneys.

UNITED STATES PATENT OFFICE.

GEORGE A. DEARDORFF, OF OCCOQUAN, VIRGINIA.

ROAD-MAP.

1,184,726. Specification of Letters Patent. Patented May 30, 1916.

Application filed March 17, 1915. Serial No. 15,105.

To all whom it may concern:

Be it known that I, GEORGE A. DEARDORFF, a citizen of the United States, residing at Occoquan, in the county of Prince William and State of Virginia, have invented certain new and useful Improvements in Road-Maps, of which the following is a specification.

This invention relates to road maps, and has special reference to maps or appliances intended for the use of automobilists as a guide in driving over an unfamiliar country whereby the location of the vehicle and the course to be pursued to reach a desired point will be accurately known at all times.

The object of the present invention is to provide novel means for actuating a web or belt upon which roads are described and instructions given for the course to be followed.

A further object of the invention is to provide novel means whereby the rotation of the vehicle wheel will cause actuation of the belt or apron, and a further object of the invention is to improve the construction and arrangement of the parts of the appliance to the end that the cost of manufacture will be reduced and the durability of the device will be increased.

The invention is fully illustrated in the accompanying drawings, and consists in certain novel features which will be hereinafter described in detail and then particularly pointed out in the claims following the description.

In the drawings: Figure 1 is a perspective view of my improved road map, showing the same in position upon the steering post of an automobile; Fig. 2 is a view in horizontal section of the complete apparatus; Fig. 3 is a longitudinal section on the line 3—3 of Fig. 2; Fig. 4 is a view, partly in end elevation and partly in transverse section; Fig. 5 is a detail perspective view of the inner supporting frame and the gearing mounted thereon; and Fig. 6 is a detail perspective view of the wheel actuated circuit closer and its support.

In carrying out my invention, I employ a casing which may be secured in any convenient manner to a bracket or clamp 1 which is adapted to fit around and be rigidly secured to the steering post of the vehicle, as shown in Fig. 1. The casing consists of side plates 2 having semi-circular ends and a back 3 having its end portions curved to fit against the said semi-circular ends of the side plates. The back plate and the side plates may form an integral structure or may be separate parts rigidly secured together by brazing or otherwise, and a face plate or cover 4 is fitted to the edges of the side plates and also has curved ends 5 which fit to the semi-circular end edges of the side plates. One end of the face plate or cover is connected by a hinge 6 to the adjacent edge of the back plate 3, while the opposite end of the face plate is provided with a fastening lip or hasp 7 adapted to engage a pin or similar device 8 upon the back plate so as to hold the face plate or cover in position. The face plate is provided with an opening 9 through which the map or route-depicting web may be viewed, and this opening is preferably glazed so as to protect the map from the weather. The face plate is provided with flanges 10 along its side edges adapted to fit against the outer faces of the side plates 2 and thereby prevent lateral movement of the face plate and also prevent the entrance of moisture between the face plate and the side plates to the interior mechanism.

The web 11 is carried upon spools or drums 12 arranged at the opposite ends of the casing and passes over guide and tension rollers 13 disposed at the ends of the casing above the drums 12 and at opposite sides of the view opening 9 so that the portion of the web between the tension and guide rollers will lie close to the said opening and may be easily read therethrough. The drums 12 and the rollers 13 are carried by an internal frame which may be bodily removed from the casing when necessary so that cleaning or repairing of the operating mechanism may be easily accomplished. This internal frame is preferably an integral structure stamped up from sheet metal whereby economy in manufacture is effected and lightness without loss of strength attained. The frame consists of a base plate having its ends turned up to form side flanges 15, the base plate fitting directly upon the inner surface of the back plate 3 of the casing and one side flange 15 fitting against the adjacent side plate 2. The other side flange 15 is spaced somewhat from the adjacent side plate 2 to provide a chamber in which a portion of the driving gearing may be located, and this latter side plate 15 has its central portion bent inwardly, as

shown at 16, parallel with the base plate 14, and a depending lip or flange 17 is formed at the inner edge of the said portion 16, as shown in Fig. 5, the purpose of which will presently appear.

Bearings for the several tension and guide rollers 13 and web-carrying drums or rollers 12 are provided in the side plates or flanges 15, and these bearings need be only perforations in the side plate. To further reduce the weight of the device, I cut away the end edges of the side plates between the several bearings, as indicated at 18, so that the bearings are formed in lugs or ears on the frame. The guide and tension rollers 13 fit between the side plates or flanges 15 of the frame, as will be readily understood, and they may be provided each at one end with a trunnion or pintle 19 to engage the adjacent bearing. The opposite end of each roller will be supported by a stub shaft 20 which is journaled in the side of the casing and has its inner end in engagement with the end of the roller so that movement imparted to the shaft will be transmitted directly to the roller. The outer extremity of this stub shaft is provided with a milled head 21 whereby the roller may be turned by hand in adjusting the device, as will be readily understood.

Upon the stub shaft 20, between the flange 15 and the side plate 2, is rigidly secured a gear wheel 22, which is in mesh with a pinion 23 mounted upon the flange 15 and also in mesh with a gear wheel 24. The gear wheel 24 is mounted loosely upon a stub shaft 25 which has its inner end fitted in a socket formed upon the axial center of the adjacent drum 12 whereby the said end of the drum will be supported, and the gear wheel 24 has a pawl 26 pivoted upon its outer face and held by a spring 27 normally in engagement with a ratchet wheel 28 which is fixed to the outer end of the stub shaft 25. A disk 29 is fixed to the shaft 25 at the inner side of the flange 15, and this disk is in frictional engagement with a similar disk 30 which is loosely mounted upon the shaft and carries pins or lugs 31 adapted to engage sockets in the end of the adjacent drum or roller 12 whereby the said disk and the drum or roller will be caused to rotate together at all times. The opposite end of the drum or roller 12 is supported by the inner end of a stub shaft 32 which is journaled in the adjacent side plate 2 and flange 15 and preferably is fitted within a sleeve 33 formed on and projecting laterally from the flange. The outer end of this sleeve is closed, as shown at 34, to provide a bearing for a spring 35 which is coiled around a reduced portion of the shaft formed between the outer milled head 36 of the same and an inner annular shoulder 37 thereon whereby the shaft is held normally toward the drum. The inner end of the shaft is provided with pins or lugs 38 adapted to engage sockets in the end of the drum whereby the shaft and the drum will rotate together, and an annular flange or disk 39 is preferably formed at the inner end of the shaft to form a guide for the web as the same is being wound upon or unwound from the roller or drum. Inasmuch as this shaft projects beyond the casing and is provided with a milled head, it facilitates the adjustment of the drum and the web and is also capable of a slight axial or longitudinal movement so as to release the drum when it is desired to remove the web or map from the casing and substitute some other web or map.

Both tension and guide rollers are mounted in the same manner and both drums or web-carrying rollers are mounted in the same manner, and it will be noted that each tension or guide roller and each drum or web-carrying roller is positively actuated, the drum and the adjacent guide and tension roller rotating in the same direction, as they are both driven from the adjacent gear 23. The ends of the web or map are secured to the drums or rollers 12, and the intermediate portion thereof is carried over the rollers 13, as will be readily understood upon reference to Fig. 3.

At the start of the trip, one roller or drum 12 will be practically free or empty while the other roller or drum 12 will have practically the entire web wound thereon. As the vehicle travels over the road, the apparatus will be operated so as to gradually unwind the web from one roller and wind it upon the other. Obviously there will be a difference in the diameter of the wound portions of the web except at that instant when the vehicle is about at the middle of the trip, and this difference in the diameters of the wound portions of the web causes a difference in the peripheral speeds of the respective wound portions, which difference would create an inaccuracy in the travel of the web and also cause a buckling of the web and consequent damage thereto but for the peculiar mounting of the drums herein disclosed and described.

The pawls 26 and the ratchets 28 engaged thereby are reversely arranged at the opposite ends of the casing so that, when one pawl is active and driving the adjacent drum, the other pawl is inactive. As the gear wheel carrying the active pawl rotates, said pawl by its engagement with the ratchet 28 will actuate the adjacent shaft 25 and through the said shaft and the disks 29 and 30 impart rotation to the adjacent drum. The other drum will then act as a drag upon the web so as to hold the same taut and prevent buckling. As the peripheral speed of the unwinding portion of the web increases,

the drum upon which the same is mounted will travel faster than the stub shaft 45 supporting the same and, consequently, the disk 30 engaging said drum will slip upon the co-acting disk and will not positively actuate the same. The speed of the tension or guide roller will be constant as it is in this instance actuated by the intermediate traveling portion of the web, and the speed of the gear wheel 24 will, of course, be constant as it is derived from the gear wheel 22 through the pinion 23, and the said gear wheel 24 carrying the pawl 26 will slip past the ratchet wheel 28 without rocking the same. This friction clutch or lost-motion connection between the actuating gearing and the drum will be found advantageous also in adjusting the map as the drum may be rotated manually by means of the shaft 32 without actuating the transmission gearing.

Motion is imparted to the pinion 23 so as to actuate the driving gearing from a shaft 40 which is journaled in the lip or flange 17 and the flange 15, as shown. This shaft 40 is equipped at its outer end with a pinion 41 and forms the fulcrum for a lever 42 which is disposed between the side plate 2 of the casing and the adjacent flange 15 of the inner frame, and has one end projected through an arcuate slot 43 in the casing and is equipped with any convenient form of handle 44 whereby it may be shifted. As shown in Fig. 3, the handle or projecting end of the lever is the lower end, and the upper end carries a pinion 45 which is adapted to mesh with one of the pinions 23 or with an idler 46 interposed between the other pinion 23 and the pinion 45. When the pinion 45 is in mesh with the adjacent pinion 23, the map will be driven in one direction and, when the said pinion 45 meshes with the idler pinion 46, the map will be driven in the opposite direction, as will be readily understood, the direction of the travel of the map corresponding at all times with the direction of travel of the vehicle so that the route depicted upon the map may be traveled in either direction with equal facility. If it be desired to consult a portion of the map which has been passed under and beyond the view opening in order to verify bearings, the lever may be shifted to a neutral position in which the pinion 45 will be out of mesh with the gear wheel 23 and the idler 46, as shown in Fig. 3, and the map may then be caused to travel past the view opening by manually manipulating either of the stub shafts 20 or one of the stub shafts 32, as will be readily understood. The lever and the side plate of the casing are provided with interengaging projections and depressions so that the lever may be held in neutral position or in position to cause travel of the web forwardly or backwardly, as desired.

The shaft 40 is equipped near its inner end with a worm pinion 47 which meshes with a worm 48 on a shaft 49 which is journaled in the base plate 14 and the inwardly projecting upper plate 16 and is equipped at its lower end with a ratchet wheel 50. Fulcrumed upon the base plate is a lever 51 which has an upstanding arm to which is secured an armature 52. The free end of the lever carries a pawl 53 adapted to engage the said ratchet wheel 50. A spring 54 is also carried by the lever 51 and bears upon the said pawl 53 so as to yieldably hold it in engagement with the ratchet wheel 50, as will be readily understood. A pin or other form of stop 55 is provided on the base plate in the path of movement of the pawl 53 so that, when the lever is actuated as presently set forth, the pawl will be carried against the said stop and will be thereby held against the ratchet wheel so that the ratchet wheel cannot ride under and beyond the pawl, but will be held to a pre-determined range of movement, and certainty in the movement of the map or web thus attained. If the pawl were permitted to move without any restriction, the momentum of the ratchet wheel would at times carry it beyond the range of movement of the pawl so that the map would be given a greater movement than is desired and would travel proportionately faster than the vehicle. By providing the stop 55, I prevent such action of the ratchet wheel inasmuch as the pawl, by contacting with the stop 55, will be locked against the ratchet wheel and, consequently, movement of the ratchet wheel past the pawl cannot occur. When the lever 51 is relieved of the actuating impulse, it will return to its initial position and the pawl will then ride over the ratchet wheel without actuating the same.

To prevent retrograde movement of the ratchet wheel, a holding pawl or dog 56 is mounted upon the base plate of the frame and held normally against the ratchet by a spring 57, as shown and as will be readily understood. The armature 52 and the lever 51 may be one integral structure or may be separate pieces rigidly connected together, but in either event they swing about a common fulcrum or pivot 58, as shown and as will be readily understood. The armature 52 co-acts with an electro-magnet 59 which is mounted upon the frame and is periodically energized through the action of elements mounted on and arranged adjacent the vehicle wheel. A spring 60 is interposed between the armature and adjacent end of the magnet so as to hold the armature normally away from the magnet and thereby tend to hold the lever 51 in its initial position. The initial position of the lever 51 may be varied so that the lever will have a movement commensurate with the diameter

and consequent travel of the vehicle wheel, and this variance in the initial position of the lever is obtained through the use of a cam 61 which is mounted upon the base plate 14 and may be turned so that its periphery will project more or less toward the transverse plane of the pivot of the lever and the lever thereby held closer to or farther from the stop 55. It is obvious that the extent of movement of the lever and the pawl carried thereby may be thus very easily and accurately adjusted so that the device may be fitted to vehicles having wheels of any diameter.

The electro-magnet is connected in circuit with the battery or magneto of the automobile and is periodically energized through a circuit closer disposed adjacent the vehicle wheel and actuated by the same. This circuit closer is illustrated in Figs. 2 and 6 and consists essentially of a casing or cylinder 62 having its outer end closed by a head or wall formed integral with the cylinder and its inner end closed by a plug 63 of insulating material. The casing forms a grounded terminal for the electric circuit including the magnet 59, and in the plug 63 I provide the coacting terminal 64 to which one of the conductors leading to the source of electrical energy is attached, as will be understood upon reference to Fig. 2, in which the circuit is shown diagrammatically.

It will be understood that there is a possibility of the vehicle coming to a rest at the instant when the circuit is closed and the magnet energized, and while a continuance of this condition would not effect undue travel of the map, it would consume electric current unnecessarily. I, therefore, interpose in the circuit a switch 65 which may be of any convenient construction and may be mounted upon one of the side plates 2 or some other point where it may be conveniently reached by the chauffeur and opened when the vehicle is at rest. When travel is resumed, the switch will be again closed, of course.

In the outer end of the tubular casing 62 is slidably mounted a pin 66 which should fit snugly in the opening provided for the same in the end of the casing so as to prevent entrance of moisture to the interior of the casing with resultant short circuiting. The inner end of this pin 66 is rigid with a sleeve 67 which is slidably mounted in the tube 62, the said pin 66 and the sleeve 67 being of metal, and the sleeve being in intimate engagement with the tube 62 so as to form an electric conductor. In the inner end of the sleeve 67 is slidably mounted a pin 68 having a head 69 within the sleeve, and a coiled spring 70 is disposed within the sleeve between the head 69 and the outer end of the sleeve, as shown, so as to yieldably hold the said head 69 against the inner end of the sleeve. The pin 68 projects through the inner end of the sleeve 67 and is axially alined with the terminal 64 so that, when the pin 68 bears against the end of the terminal 64, the circuit will be closed and the desired movement imparted to the map. A coiled spring 71 is mounted within the tube 62 and bears at one end against the sleeve 67 and at the opposite end against the insulating plug 63. The normal position of the parts is indicated in Fig. 2. Should pressure be exerted upon the outer end of the pin 66, the said pin and the sleeve 67 will be pushed inwardly and the spring 70 will hold the head 69 against the inner end of the said sleeve so that the pin 68 will travel with the sleeve. This travel will be interrupted only by the end of said pin striking the terminal 64 whereby the electro-magnet 59 will be energized. Should the pressure exerted upon the pin 66 be greater than normal, the springs 70 and 71 will yield so that, while the sleeve 67 may move inwardly to an abnormal degree, the pin 68 will not be held against the terminal 64 with such force as to injure the same or tend to impair the efficiency of any of the parts. As soon as the pressure upon the pin 66 has been removed, the springs will expand and return the parts to the initial position illustrated.

The tubular casing 62 is fitted in and held by a clamp 72 which is mounted upon the upper end of a bracket 73 secured upon the radius rod 74 of the vehicle. This bracket consists of a lower portion having a longitudinal slot 75 and formed with spaced lugs 76 adapted to fit against the upper and lower sides of the radius rod, as shown in Fig. 6. A clip 77 is fitted around the radius rod and has its ends passed through the slot 75 and through a plate 78 fitted against the standard 73, the terminals of the clip being threaded and nuts 79 being mounted upon said threaded terminals and turned home against the said washer and clamping plate 78 so that the device will be rigidly secured in position upon the radius rod. Upon the side of the vehicle wheel or the end of the hub thereof, I provide a bracket 80 which is so disposed that, as the wheel rotates, the inner face of the said bracket will ride against the end of the pin 66 and thereby press the same inwardly so that the before described operation will result. This bracket 80 may be of any convenient form and is in effect a cam having inclined or beveled ends so that it will easily engage the projecting end of the pin 66 and ride under the same, the pin moving inwardly within the tubular casing 62 as one cam or inclined end of the bracket engages the same, and then moving outwardly again as the following cam or inclined surface is brought into engagement with the pin.

In order that the device may be used at

night, I provide within the casing an electric lamp 81 which, when illuminated, will impart transparency to the map so that it may be easily read. This lamp is illustrated diagrammatically as receiving current from the same battery or other source of energy as the magnet 59 and controlled by a switch 82 which may be of any convenient form.

It is thought the operation and the advantages of the device will be readily understood from the foregoing description taken in connection with the accompanying drawings.

The map is, of course, adjusted at the start of the journey so that the point initially exposed through the view opening will correspond to the starting point or location of the vehicle. As the vehicle travels over the road, the actuating cam or bracket 80 upon the wheel will be brought against the end of the pin 66 at the close of each complete revolution of the wheel, and consequently the magnet will be energized so that the armature 52 will be drawn against the magnet and the lever 51 vibrated. As before stated, the pawl 53 will be thereby caused to impart motion to the ratchet wheel 50, and this motion will be transmitted directly to the shaft 49 so that the worm 48 will actuate the worm pinion 47 and motion thereby imparted to the shaft 40. As the pinion 41 upon said shaft is in constant mesh with the pinion 45, the map will be moved in one or the other directions, accordingly as the said pinion 45 is in mesh with the gear 23 or the idler 46. As soon as the bracket or cam 80 has cleared the pin 66, the circuit will be broken and the magnet deënergized so that the spring 60 will expand and the armature be returned to its initial position thereby bringing the lever 51 back against the stop 61 so that the parts will be in position for the next impulse upon the completion of the next revolution of the vehicle wheel.

It will be noted that my device is very simple in the construction and arrangement of its parts and, consequently, will not be apt to get out of order and need constant repairs. The moving parts of the actuating mechanism are all inclosed so that they will not be affected by climatic conditions and, with the exception of the stub shafts which project through the casing, the mechanism acting directly upon the map is all carried by the interior frame so that, by withdrawing the stub shafts from the rollers respectively engaged by them, the said frame and all the mechanism may be removed from the casing for inspection, cleaning or repairing. The peculiar construction of the circuit closer co-acting with the vehicle wheel will permit the said circuit closer to accommodate itself to variations in the force exerted by said wheel due to the warping of the same. The device is obviously adjustable along its own axis within the clamp 72 and, when being applied, will be set to the maximum distances between the hub of the wheel and the adjacent radius rod. Consequently, if the wheel should warp so as to decrease the distance between the end of its hub and the radius rod, the cam would still engage the outer end of the circuit closer but would not impart any greater travel to the same and, consequently, would not tend to drive from the casing the insulating plug or otherwise damage the device.

Having thus described the invention, what is claimed as new is:—

1. An apparatus for the purpose set forth comprising a casing, a frame secured in the casing and having one side spaced from the adjacent side of the casing and provided with an inwardly projecting overhanging support, drums mounted in said frame, guide and tension rollers mounted in the frame adjacent the respective drums, a web secured to and adapted to wind on the drums and having its intermediate portion passing over the guide and tension rollers, mechanism disposed in the space between the side of the frame and the adjacent side of the casing to actuate the drums and the respectively adjacent guide and tension rollers, said mechanism having a member mounted in the side of the frame and the inwardly projecting overhanging support thereon and means within the frame acting on said member for operating said mechanism.

2. In an apparatus for the purpose set forth, the combination of a casing, a frame disposed within the casing and comprising a base plate, flanges integral with said base plate, and an inwardly extending bracket formed integral with one of said flanges and provided at its inner edge with a depending lip, the said flange being spaced from the adjacent side of the casing and the base plate, and the opposite flange being fitted directly against the opposite side of the casing, a shaft journaled in the said depending lip and the adjacent flange of the frame, means for rotating said shaft, a lever fulcrumed upon the end of said shaft between the adjacent flange and the side of the casing, a pinion on said shaft, a pinion carried by said lever in constant mesh with the first-mentioned pinion, rollers mounted in the frame, a web carried by said rollers, and means adapted to be actuated from the pinion on the lever to drive said rollers.

3. In an apparatus for the purpose set forth, the combination of a support, rollers mounted on the support, a web carried by said rollers, a shaft on the support, gearing operatively connecting said shaft with the rollers, a ratchet wheel on said shaft, a lever mounted on the support adjacent said

ratchet wheel, means for vibrating said lever, a pawl pivoted on said lever at the free end thereof to engage the ratchet wheel and actuate the same, and a fixed stop interposed in the path of movement of the lever whereby the pawl will impinge against the stop and be thereby locked to the ratchet wheel and arrest the rotation of the same at the limit of movement of the lever.

4. In an apparatus for the purpose set forth, the combination of a support, rollers mounted thereon, a web carried by said rollers, a shaft upon the support, gearing operatively connecting said shaft with the rollers, a lever pivoted upon the support, a pawl pivotally mounted at the free end of said lever and engaging the ratchet wheel, a stop disposed at one side of the lever to be engaged by the pawl, and an adjustable stop at the other side of the lever against which the lever impinges.

5. In an apparatus for the purpose set forth, the combination of a support, rollers mounted thereon, a web carried by said rollers, a shaft mounted upon the support and operatively connected with the rollers, a ratchet wheel on said shaft, a lever pivoted upon the support, means for vibrating said lever, a pawl carried by the lever and engaging the ratchet wheel, and stops disposed at opposite sides of the lever, one of the stops being in the path of movement of the pawl at the limit of movement of the lever to lock the pawl against the ratchet.

6. In an apparatus for the purpose set forth, the combination of a support, rollers mounted thereon, a web carried by said rollers, means on the support to actuate said rollers including a shaft and a ratchet wheel on said shaft, an electro-magnet on the support, means for periodically energizing said electro-magnet, a lever fulcrumed on the support between the electro-magnet and the ratchet wheel, an armature rigid with said lever and rising from the fulcrum thereof, a pawl fixed on the lever at the free end thereof and engaging the ratchet wheel to actuate the same, and a stop in the path of said pawl to bind the same against the ratchet and arrest the movement of the lever, the pawl and the ratchet wheel.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE A. DEARDORFF. [L. S.]

Witnesses:
HATTIE V. S. CARTER,
H. C. CARTER.