Nov. 20, 1928. 1,692,489

C. B. DINSMORE

ODOMETER TRANSFER MECHANISM

Filed Feb. 28, 1927

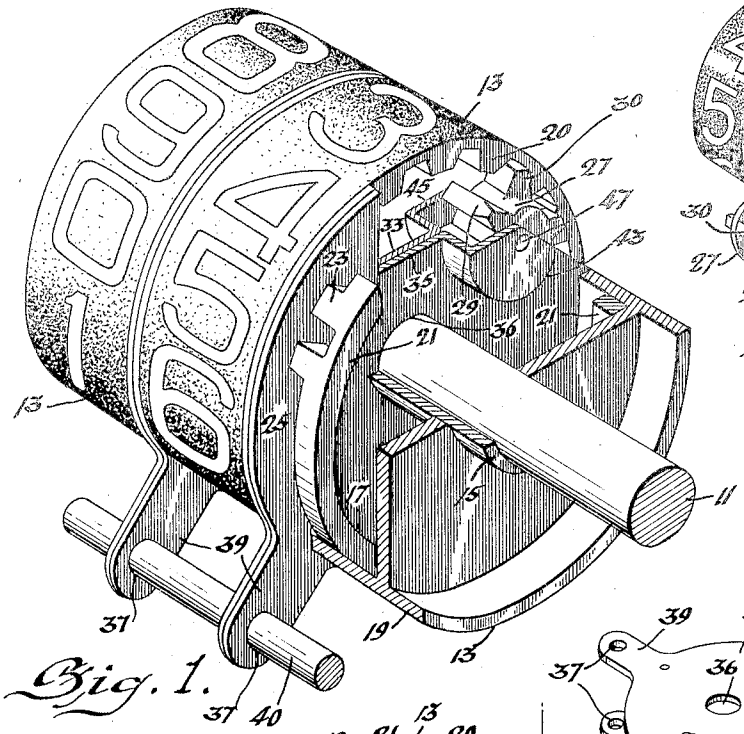


Fig. 1.

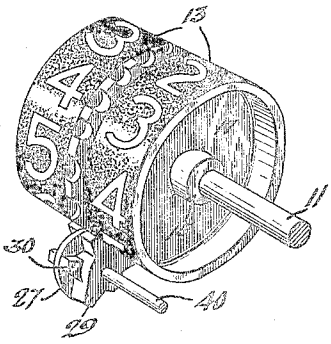


Fig. 4.

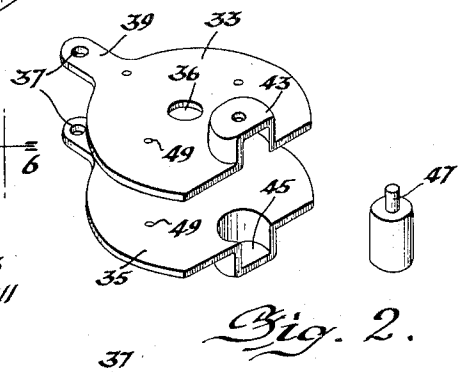


Fig. 2.

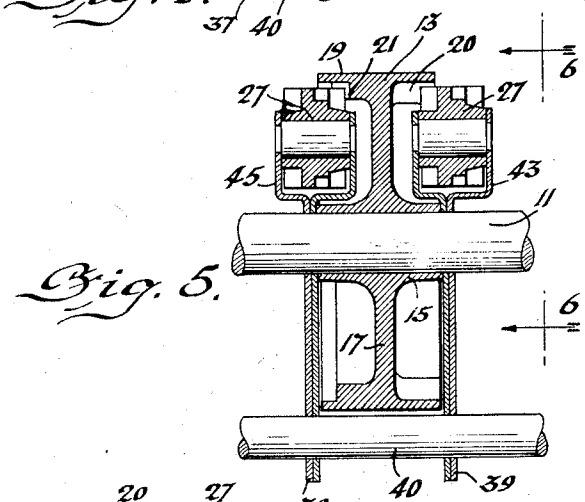


Fig. 5.

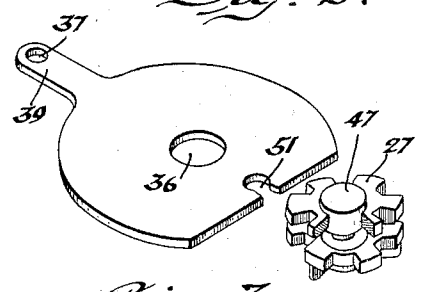


Fig. 3.

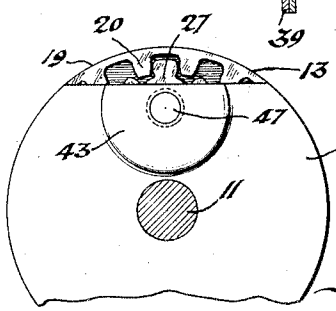


Fig. 6.

Inventor

Clarence B. Dinsmore

By Blackmore, Spencer & Flint

Attorneys

Patented Nov. 20, 1928. 1,692,489

UNITED STATES PATENT OFFICE.

CLARENCE B. DINSMORE, OF FLINT, MICHIGAN, ASSIGNOR TO A C SPARK PLUG COMPANY, OF FLINT, MICHIGAN, A COMPANY OF MICHIGAN.

ODOMETER TRANSFER MECHANISM.

Application filed February 28, 1927. Serial No. 171,707.

This invention relates to measuring instruments and has been designed particularly as an improvement in the odometer of the odometer speedometer combination as used on vehicles. Although the use of the subject matter of the invention in the relation stated has been foremost in mind, it is nevertheless to be understood that its utility is not limited to this specific field as it may be used in other instruments where a similar relation between the movable parts exists.

An object of the invention is to provide for the intermittent partial rotation of one wheel by the rotation of a co-axial wheel making use of an intermediate star pinion rotated by internal gearing.

Another object is to secure a maximum smoothness of operation.

As another object the invention aims to house the star pinions within the periphery of the number wheels.

The invention also has for an object the utilization of the star pinion shaft of existing external gear installations as a means for positioning the star pinions driven by the internal gearing.

Other objects and advantages will be obvious upon a reading of the following specification and an examination of the accompanying drawing.

In the drawing,

Figure 1 is a perspective of the odometer partly assembled, certain parts being broken away to better show the construction and operation.

Figure 2 is a similar view of a detail, showing in disassembled relation the parts used in mounting the star pinion.

Figure 3 shows in perspective a modified form of a star pinion carrier.

Figure 4 is a view in perspective of an externally driven type of odometer, the figure being intended to illustrate the interchangeable nature of the parts of the new and old mechanism.

Figure 5 is a radial section through one of the number wheels and its cooperating star pinions.

Figure 6 is a view in elevation taken on the line 6—6 of Figure 5.

Referring by reference characters to the drawing, numeral 11 is a shaft upon which number wheels 13 are assembled for rotation. These number wheels carry figures from 0 to 9. Since the figures on each wheel are to be read as of a denomination ten times as great as the figures of the next adjacent wheel of lower denomination, it is necessary to provide mechanism to turn each wheel through an arc corresponding to one figure when a wheel of lower denomination is given one complete rotation.

For the accomplishment of the above object I make the number wheels as shown. These wheels are formed with a central hub 15, a web 17 and a peripheral surface 19. It is upon this peripheral surface that the figures 0 to 9 are placed. Upon one side of the central web there are teeth 20 inwardly directed from the rim position. Upon the other side of the central web is a ring 21 engaging the web and the rim portion. From the ring 21 there project axially two spaced teeth 23 and the material between said teeth is cut away for part of the thickness of the ring as at 25 whereby the thickness of the ring is less between the teeth than elsewhere. This ring may be integral or separable from the wheel as preferred. In assembling the odometer the number wheels may be placed on shaft 11 in such a way that the side of the wheel having teeth 20 is situated adjacent the side of the next wheel having teeth 23.

A star pinion is used to cause a complete rotation of one wheel to turn the next wheel through an arc corresponding to one figure. Such star pinion is designated by numeral 27. It has long teeth 29 and short teeth 30 alternating therewith, both kinds of teeth terminating adjacent one edge of the star pinion.

A pair of segmental stamped plates 33 and 35 have registering openings 36 to receive shaft 11. Both stamped plates 33 and 35 have radial extensions or arms 39 provided with openings 37 to receive a shaft 40, which shaft is the parallel shaft upon which the usual star pinions are mounted for engagement with external teeth on the number wheels, as shown in Figure 4, this being the more usual construction. The two stampings are provided with cup-shaped depressions 43 and 45. These cup-shaped depressions are apertured for carrying axial pins 47 upon which the star pinions are mounted. If preferred, the star pinion may be made integral with the shaft 47, but I believe it better to mount the star pinion for rotation on its pin 47 and also to give pin 47 a loose pivotal mounting in the stamping. The two stampings are riveted together, apertures for the rivets being shown

at 49. The assembled stampings are positioned as shown between adjacent number wheels and in such a way that the shortened teeth face the two tooth side of the number wheel, the radial arms 39 extending outwardly and mounted on the rod 40, as explained.

Figure 3 shows a modified form of star pinion assembly. In this form the star wheel pin is intermediately provided with an annular groove. In the place of a pair of stampings a single segmental plate is used. This plate has the apertures 36 and 37 for the shafts as before, and has additionally a radial notch 51 through which the intermediate lesser diameter portion of the star pinion is assembled. On one side of the stamping the star pinion has equally spaced full sized teeth for engagement with the complete set of number wheel teeth 20. On the other side of the stamping the complemental part of the star pinion has alternating short and long teeth as before.

The operation may be briefly explained. The rotation of the tens number wheel by the rotating unit number wheel may serve the purpose of the explanation. As the unit wheel rotates the inner periphery of its ring 21 engages the surface of the alternate long teeth and thus prevents the rotation of the star pinion and consequently of the tens number wheel. When the unit wheel is completing a full turn its projecting teeth 23 engage the teeth of the star pinion and turn the same sufficiently to move the tens wheel through an arc corresponding to a single figure. As the first tooth 23 engages the short tooth of the star pinion it will be seen that the adjacent long tooth of the star pinion lies opposite the deep groove between the two teeth 23. This permits the rotation of the star pinion as will be obvious. The tens wheel is thereafter prevented from turning for the period of another full rotation of the units wheel since, as explained, two alternate long teeth are held from rotating by engaging the inner periphery of the ring member 21. In a similar way the tens wheels may operate the hundreds wheel.

By the arrangement described the internal gear, with its inherent advantages is made use of instead of a more commonly employed external gearing. The star pinions are completely housed within the periphery of the number wheels. Other means may be employed for retaining the star pinion in position. It is obviously not necessary that the stampings be held by rod 40 heretofore used for the star pinion. However, with the present construction wherein the shaft 40 is available it is very convenient to employ this shaft in the way shown. By the arrangement illustrated the internal and the external type of drive are interchangeable.

I claim:

1. In a registering instrument, number wheels having internal gears, an external star pinion between said number wheels in driving and driven relation thereto, a mounting for said star pinion including segmental plate means coaxial with and of the same radius as the number wheels having a radial extension, means to engage said extension and fixably support said mounting.

2. In a registering instrument, number wheels having internal gear teeth, an external toothed star pinion between said number wheels, a mounting for said star wheel comprising a pair of segmental plates secured together, the segmental plates being coaxial with and of the same radius as the number wheels, said plates having matched radial extensions and cooperating opposite off-set depressions to form a star pinion housing, and means engaging said extensions to fixably support said housing.

In testimony whereof I affix my signature.

CLARENCE B. DINSMORE.