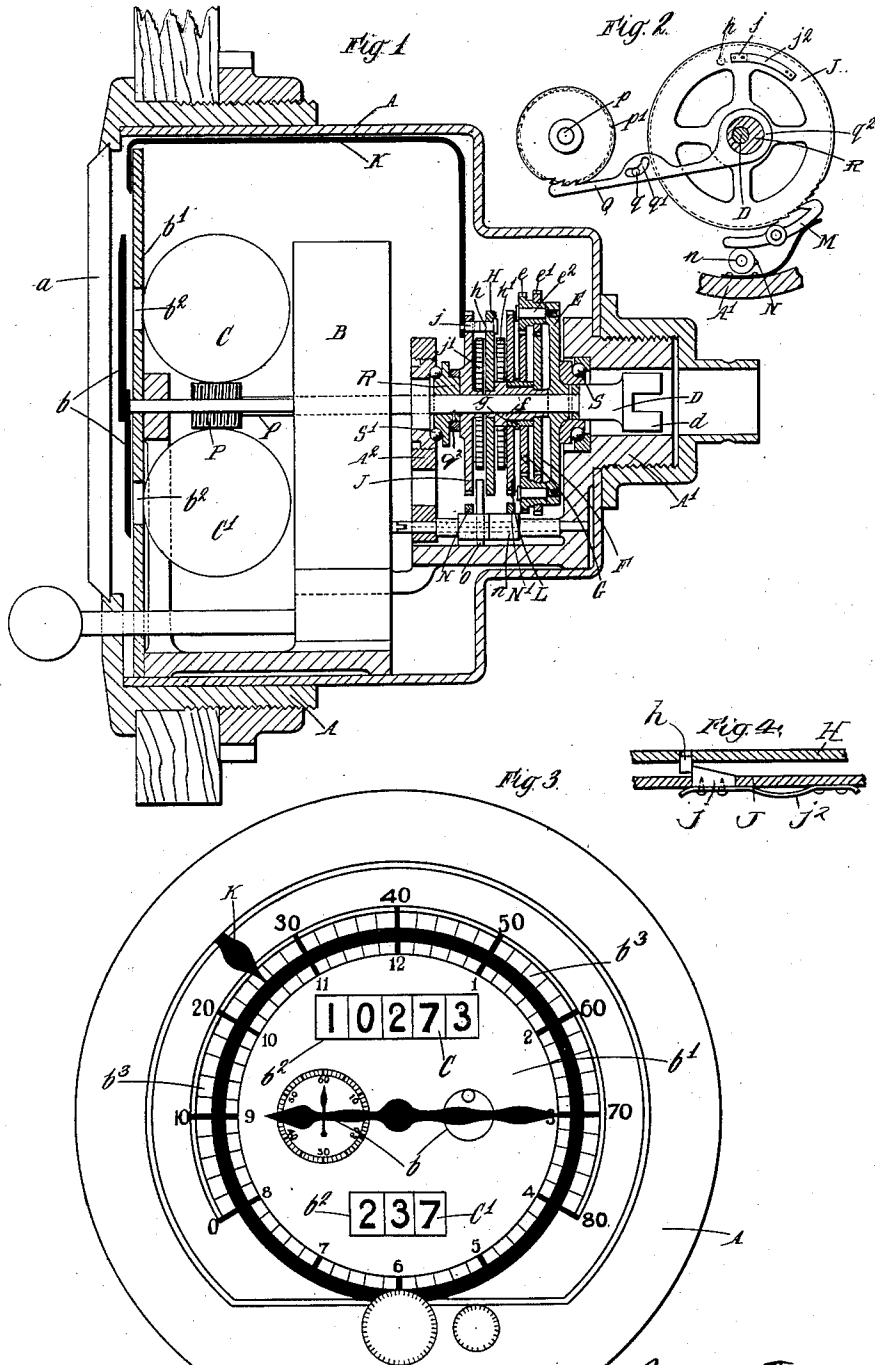


A. SPEIGHT.
SPEEDOMETER.

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1,378,428.

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UNITED STATES PATENT OFFICE.

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SPEEDOMETER.

1,378,428.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ALFRED SPEIGHT, a subject of the King of Great Britain, residing at 61 Arthur road, Wimbledon Park, in the county of Surrey, England, have invented certain new and useful Improvements in Speedometers, of which the following is a specification.

This invention relates to speedometers such as are employed on motor vehicles, of the type in which an escapement is periodically operated by clockwork or like mechanism.

According to this invention the drive of the speedometer mechanism is effected through an epicyclic gear, one member of which is released periodically by the escapement so as to render the gear inoperative. The large reduction in speed desired between continuous drive and the intermittently actuated indicating device is obtained directly in this manner with a minimum amount of gearing.

In order that the said invention may be clearly understood and readily carried into effect, the same will now be described more fully with reference to the accompanying drawings, in which:—

Figure 1 is a section through speedometer apparatus embodying this invention.

Fig. 2 is a detail view of part of the driving mechanism.

Fig. 3 is a face view of the apparatus.

Fig. 4 is a detail view of the disk studs.

A is the casing of the apparatus provided with a glass front *a* through which the readings can be viewed. B is a clock the hands *b* of which are in front of the clock face *b'* which is provided with apertures *b²* enabling the numbers on the odometer drums C, C' for total and daily mileage to be read. The clock face *b'* is also marked with the scale *b³* outside the time indications, this scale showing the speed in miles per hour.

D is the speedometer shaft adapted to be connected through the notched end *d* with the usual flexible driving shaft. On the shaft D is mounted the planetary carrier E in the form of a pair of arms, each arm carrying the pair of planetary pinions *e, e'* on the pin *e²*, the pinions *e, e'* turning solid with each other but differing slightly in size. F is a sun wheel gearing with the pinions *e'* and mounted upon the sleeve *f*. G is a second sun wheel mounted upon the outer sleeve

g which is free to turn on the inner sleeve *f*, the sun wheels F and G having a slight difference in the number of their teeth.

On the sleeve *f* is mounted the driving wheel or disk H carrying a driving stop or stud *h* adapted to engage with a stop *j* on the disk J carrying the pointer K which extends over the edge of the dial *b'*, the end of the pointer reading on the scale *b³*. The disks H and J are under the control of the coiled or clock springs *h'* and *j'*. On the sleeve *g* is a ratchet wheel L and the wheel or disk J is also provided with ratchet teeth, a spring pawl M, shown in Fig. 2, being provided for each of the ratchet wheels. N, N' are two clockwork driven cams mounted on the spindle *n* which releases the pawls M at regular intervals.

When the ratchet wheel L is held stationary by its pawl M the sun wheel G is also held stationary as both the ratchet wheel and sun wheel are on the same sleeve *g*. In this condition the shaft D rotating at a speed depending upon the speed of the drive takes with it the planetary carrier E with the two pairs of planetary pinions *e, e'*. The sun wheel G being fixed, the planetary pinion *e* rolls around the wheel and as the sun wheel F is of slightly smaller diameter than the wheel G, having say one tooth less in its circumference, the sun wheel F is driven at a speed depending upon the difference in the number of teeth, that is, at a speed very greatly reduced as compared with the speed of the drive. The sun wheel F turns with it the driving disk H through the sleeve *f* on which the said disk is mounted and the stop *h* engages the stop *j* on the pointer disk J, providing the latter stop is not already in advance, so that the pointer disk is carried around against the action of its spring *j'*, the pawl M engaging the ratchet disk J to hold it in the most forward position to which it is carried by the stud *h*.

At the end of a predetermined time controlled by the clock B the cam N releases the pawl M from the disk J so that the latter is free to be turned back by its spring *j'*, the spring *j'* insuring that the two stops or studs *h* and *j* are brought into contact so that in the event of the speed falling the pointer returns to the position determined by the driving disk H. Shortly after the release of the disk J and its reengagement by its pawl M the cam N' releases the corresponding pawl and frees the ratchet disk L and

also the sun wheel G. The epicyclic drive is at once rendered ineffective and the sun wheel F is no longer driven, the spring h' returning the driving disk H together with the sun wheel F to zero position, which may be determined by the fixed stop O shown in Fig. 1 against which the stud h abuts, the driving disk H leaving the pointer disk J in the position already determined by the maximum movement of the driving disk. Immediately the cam N' passes beyond its pawl releasing position the pawl M engages the ratchet wheel L again holding the sun wheel G stationary and allowing the drive to come into operation. The cams N, N' operating at fixed intervals of time, say once every second, allow the drive to be operative through a definite portion of the second and the distance traveled by the driving disk H at each operation is thus determined by the speed of the drive acting through the epicyclic gearing. The pointer K is therefore adjusted in position every second and gives an accurate reading of the speed at any moment.

To allow for a reverse drive without operating the pointer the stop j slopes at one side and is pressed forward by the spring j^2 shown in Figs. 2 and 3, this spring allowing the stop to be pressed back by the stud h when the latter is turned in the reverse direction for the backward drive. The speedometer therefore does not read for back drive.

The odometer drums C, C' are driven through the worm P on the shaft p provided with a ratchet wheel p' with which engages the driving pawl Q turning on the pin q through the curved slot q' , the other end of the pawl forming the strap q^2 of the eccentric R on the speedometer shaft D as shown in Fig. 2. For every rotation of the shaft D the ratchet wheel p' is turned through one tooth and the worm wheel P is therefore slowly rotated at a speed varying with the speed of the drive.

The speedometer unit is mounted in the ball bearings S, S' carried respectively in a part of the main frame A' and a loose frame

A² detachably secured to allow the speedometer unit to be assembled complete.

What I claim and desire to secure by Letters Patent of the United States is:—

1. In a speedometer, speed indicating mechanism, a continuously driven speedometer shaft, a carrier on the said shaft, a pair of epicyclic pinions on the said carrier secured together for rotation, a pair of sun wheels of slightly different diameters gearing with the said pinions, of which sun wheels one is connected to the indicating mechanism and the other is provided with means by which it is intermittently held stationary and periodically released, and means for returning the first sun wheel to zero position at each release of the second sun wheel.

2. In a speedometer, speed indicating mechanism, a continuously driven speedometer shaft, a carrier on the said shaft, a pair of epicyclic pinions on the said carrier secured together for rotation, a pair of sun wheels of slightly different diameters gearing with the said pinions, of which sun wheels one is connected to the indicating mechanism, a ratchet wheel connected to the other sun wheel, a pawl adapted to hold the said ratchet wheel stationary, means for periodically releasing the ratchet wheel and means for returning the first sun wheel to zero position on release of the ratchet wheel and its connected sun wheel.

3. In a speedometer, speed indicating mechanism, comprising a pointer and pointer carrying disk, an intermittently operated driving disk, cooperating studs on the said carrying and driving disks of which studs one is spring supported and is adapted to act for driving in one direction only, and an epicyclic driving gear comprising one sun wheel connected to the driving disk, a second sun wheel adapted to be held stationary and periodically released and a driving carrier provided with a pair of planetary pinions secured together for rotation engaging the said sun wheels.

ALFRED SPEIGHT.