Sept. 7, 1965 O. CHATELAIN ETAL 3,205,502

TACHOGRAPH

Filed March 15, 1962 2 Sheets-Sheet 1

FIG.1

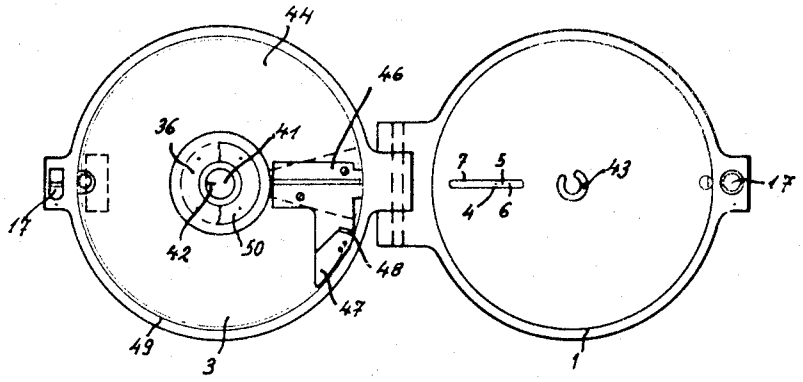
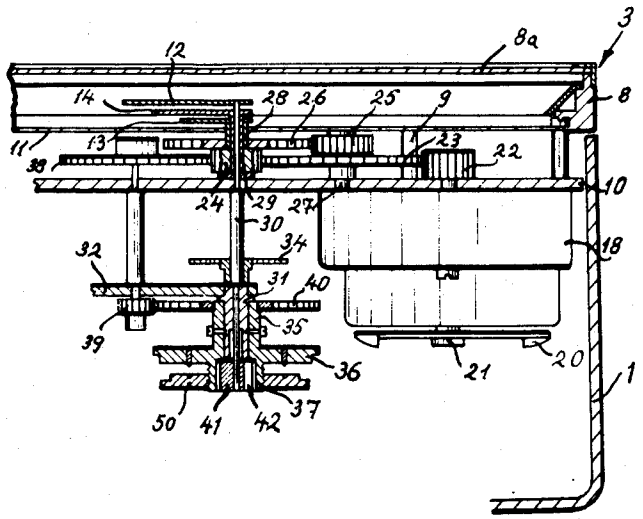


FIG.4



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TACHOGRAPH

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FIG.2

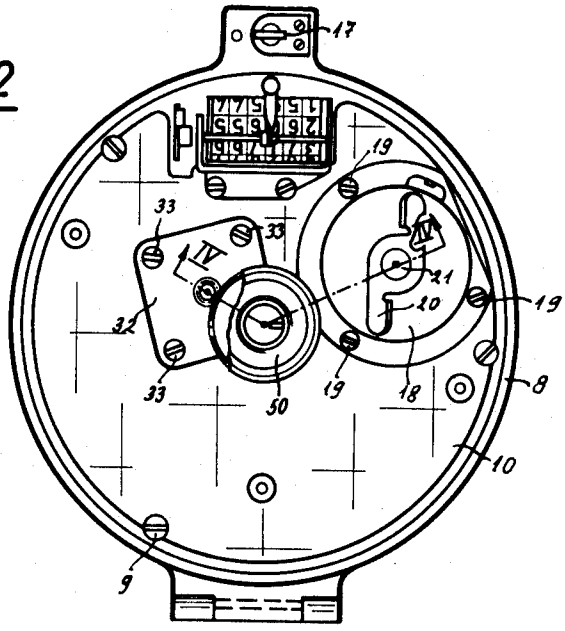
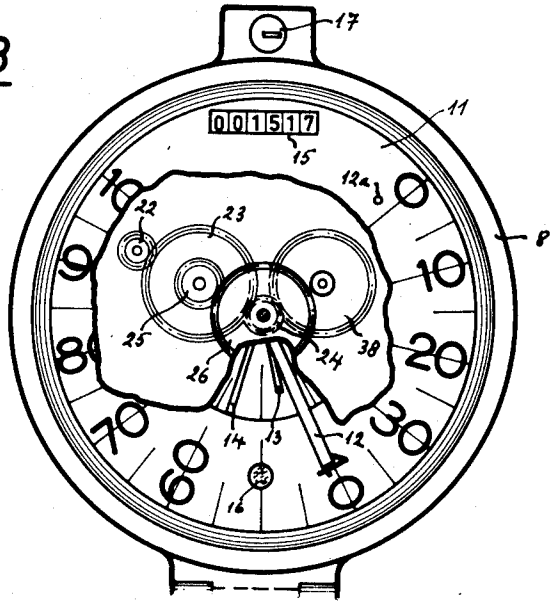


FIG.3



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TACHOGRAPH

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Claims priority, application Switzerland, Sept. 15, 1961, 10,765/61
2 Claims. (Cl. 346—18)

Tachographs are already known, which provide a record or graph on rotary discs driven in rotation, in registry with one or more tracing styluses, by a clockwork rigid with the cover of said tachographs.

In a number of the prior instruments, the record discs are secured to the cover by means of an arrangement extending above the clockwork, which is then fitted at the center of the cover.

Such tachographs are comparatively high because the speed-reducing gears are fitted directly between the disc-securing means and the clockwork movement. Furthermore, these tachographs have a drawback in that they must be entirely dismantled whenever the clockwork movement is to be repaired, so that they are unfit for use during a comparatively long down time.

In other, more recent tachographs, the various parts of the clockwork and also the speed-reducing gears are arranged, underneath the speed-indicating dial, in side-by-side relationship in a common plane, so as to reduce to the utmost the height of the tachographs. The latter have however the same drawbacks as those referred to above, consisting in that it is necessary to entirely dismantle them when repairing the clockwork.

The present invention has for its object a tachograph for vehicles, wherein the measuring mechanisms and at least one tracing member controlled by the latter, are carried inside a casing to which is pivotally secured a cover provided with at least one member indicating the measured speed, together with a milemeter and an arrangement for positioning and carrying along at least one graph-carrying disc in registry with the tracing members, so as to form curves of the measured magnitudes, and lastly also a clockwork controlling the arrangement.

According to the invention, the movement of the clockwork is removably carried by the cover eccentrically with reference to the disc-carrying means, while means connect kinematically the clockwork movement with the carrying means.

The accompanying drawings illustrate, by way of example, a preferred embodiment of my invention. In said drawings:

FIG. 1 is a plan view of the tachograph in its open position.

FIGS. 2 and 3 are detail views of the cover as seen from the back and from the front respectively.

FIG. 4 is a cross-section view taken through line IV—IV of FIG. 2.

The tachograph illustrated (FIG. 1) includes a casing **1** to which is pivotally secured at **2** a cover **3**. Inside the casing are arranged tracing styluses **4**, **5** and **6**, adapted to record the speed of a vehicle, the duration of the stoppage periods and of the running periods of the vehicle and also the distance travelled. The ends of the styluses project through a slot **7**. The styluses are shifted in a conventional manner by means which are not illustrated and which are carried inside the casing **1**.

The cover is constituted by an annular rim **8** provided with a glass insert **8***a* behind which is secured a plate **10** through the agency of uprights or spaces **9** rigid with a dial **11**. A first space is defined between the cover and a frontside of plate **10**. A second space is defined by the casing **1** and a backside of the plate **10**. The dial is

provided with two indicating areas, to wit: an outer annular area carrying a scale ranging between 10 and 100 over which a hand **12** indicates visually the velocity of the vehicle and an inner area carrying an annular time scale or indicia including twelve radial lines, in registry with which the hands **13** and **14** move.

At its upper end, the dial is provided with a rectangular gate **15** through which a fraction of the edge of a milemeter appears in view. The milemeter is carried by the plate **10**, whereas the lower part of the dial carries a visually indicating signal **16**, for example a red lamp, which is illuminated automatically whenever the hand **12** indicates a predetermined limit speed.

The securing of the cover to the casing is performed by means of a lock **17** rigid with the rim **8**.

The hands **13** and **14** are time indicating hands driven by a clockwork **18** controlled by a spring mechanism or by an electric motor also carried by the plate **10**. The clockwork is eccentrically carried by the plate. The clockwork is secured to the backside of plate **10** by three screws **19** accessible when the cover is open so that it may be readily dismantled and replaced. The tachograph is provided with a winding key **20** and a knob **21** for setting the hands to time.

The hands are connected with a driving spindle **22** of the movement through a speed-reducing gear clearly shown in FIGS. 3 and 4. The hour hand **13** is controlled by the wheels **23** and **24** and the minute hand **14** by the wheels **23**, **25** and **26**. The wheels **23** and **25** are carried in a loose condition on an intermediate spindle **27** carried by the plate **10**, whereas the wheels **24** and **26** are rigid with sleeves **28** and **29** respectively, arranged concentrically with reference to each other and carrying the corresponding hands **13** and **14**.

The speed-indicating hand **12** is rigid with one end of a spindle **30** extending through the sleeve **29** and revolvably carried in a support **31** rigid with a square bridge **32** carried by the plate **10** through three spacers **33**. The spindle **30** is subjected to the return action of a spiral spring **34** urging the hand **12** against a stop **12***a* carried by the dial **11**.

The support **31** revolvably carries coaxially with the spindle **30** a sleeve **35** rigid at mid-height with a plate **36** and provided with an outer thread **37**. The sleeve and its plate **36** are kinematically connected with the pinion **26** through wheels **38** and **39**, the wheel **39** meshing with a wheel **40** rigid with the sleeve **35**. The wheels **38**, **39** and **40** have a size such than when the hour hand executes one complete revolution over the dial, the plate **36** revolves by 26/24 x 360°.

Inside the sleeve is fitted a knob **41** rigid with the end of the spindle **30** and provided with a longitudinal slot **42** engaged by a movable projection **43** when the cover is folded back over the casing, the position of said projection varying with the speed that is being measured.

The plate and the clockwork movement are covered by a dust protector **44** (FIG. 1) formed by a cylindrical dished part, the bottom of which extends flush with the plate **36** and is provided in its central area with a circular opening which is not illustrated and the size of which corresponds with that of the plate. The dust protector is provided with a flap **46**, with a selecting tongue **47** and with a stop **48**. It is secured to the plate **10** through any suitable means.

The tachograph illustrated and described is intended more particularly for the recording of the magnitude measured and recorded on a stack **49** of graph-carrying discs illustrated diagrammatically by a circle drawn in dot-and-dash lines; but, of course, the instrument may be used with a single disc.

It is apparent that such a stack is constituted for instance, by six or seven records or discs provided each with

a radial slot, the breadth of which corresponds to 2/26 of their perimeter, which discs are stacked in a manner such that the ridges defining the different slots form through their succession a helical surface. The discs are fitted on a socket, the height of which is greater than the height of the stack, they are positioned over the cover of the tachograph through engagement of the socket over the sleeve **35** and are held fast against the plate **36** by a tapped nut **50**. The discs forming the stack are rigidly secured to the socket, for instance through radial projections engaging corrugations in the socket.

Once every twenty-four hours, a completed disc is urged by the tongue **47** against the stop **48**, which stops its movement so that the styluses continue drawing their records on the immediately underlying disc. With such a tachograph, it is consequently possible to continuously record the magnitudes measured during a succession of days.

What we claim is:

1. In a tachograph, a cup-shaped casing, a cover pivotally mounted on said casing and comprising a rim, a crystal mounted in said rim, a dial mounted in said rim and spaced back of said crystal, a plate spaced back of said dial and fixed relative thereto, a speed-indicating hand between said dial and crystal, a central spindle carrying said hand and extending rearwardly through said dial and plate and into the interior of said casing, driving means in said casing coupling with said spindle to drive it, a time-indicating hand between said dial and crystal, a shaft coaxial with said spindle and carrying said time-indicating hand, a self-contained clockwork unit disposed in said casing on the rear of said plate wholly at one side of said spindle, means removably securing said clockwork unit to the rear of said plate for easy removal as a

complete unit, said clockwork unit having a rotary output member aligned with an opening in said plate, means including gear means between said dial and plate drivingly connecting said shaft of said time-indicating hand with said output member of said clockwork unit to be driven thereby, a chart-holding member rotatably mounted coaxial with said spindle and having a chart-supporting surface in a plane immediately back of said clockwork unit, means including said gear means drivingly connecting said chart-carrying member with said output member of said clockwork unit and said time-indicating hand shaft, and a stylus in said casing in position for engagement with a chart on said chart-holding member, said cover being swingable by said pivotal mounting to an open position affording access to said complete removable clockwork unit.

2. A tachograph according to claim **1**, in which said means drivingly connecting said chart-holding member with said clockwork unit and time-indicating hand shaft includes a second shaft offset laterally from said spindle, a gear on said further shaft, and a gear on said chart-holding member driven by said last-mentioned gear.

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LEO SMILOW, *Primary Examiner.*