

Sept. 5, 1933.

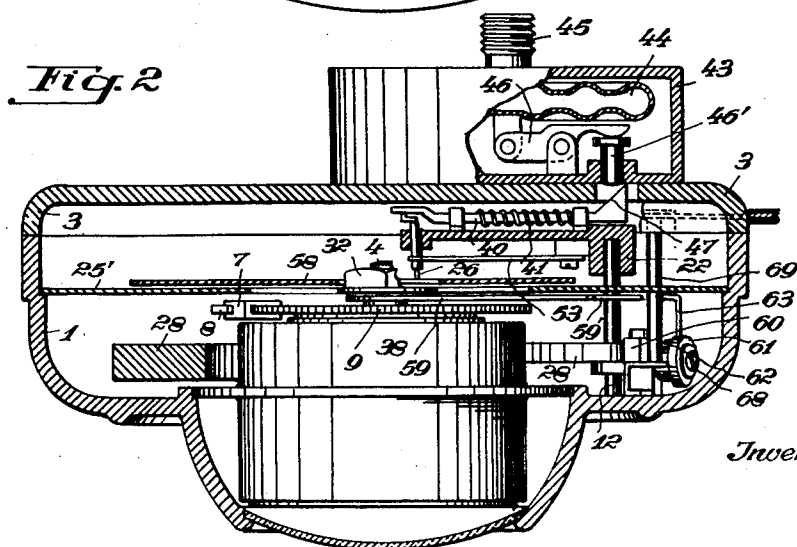
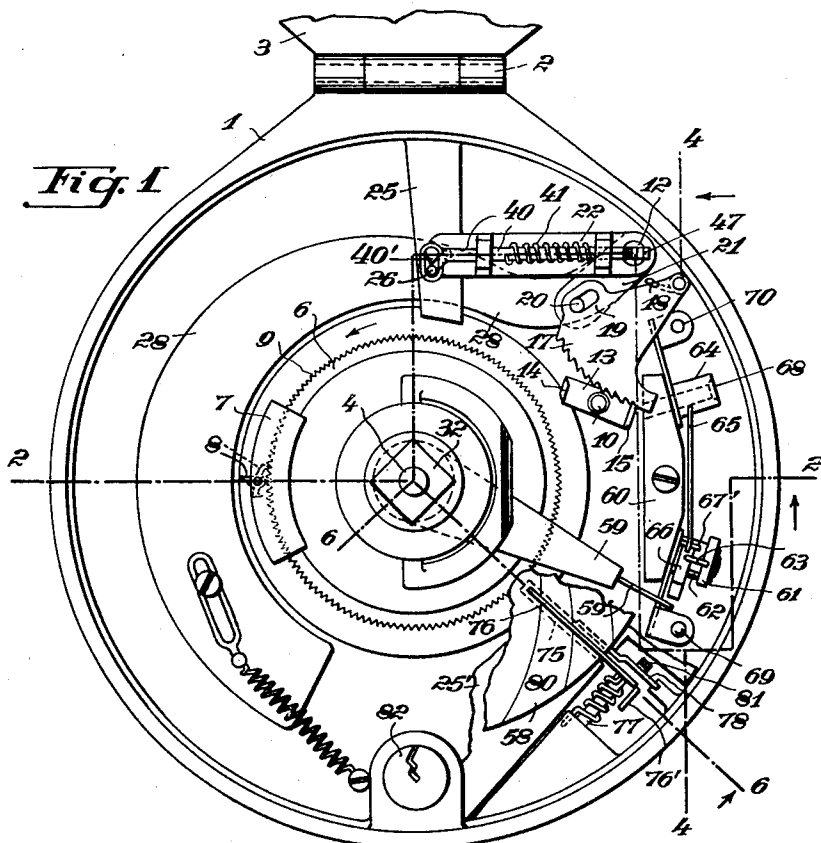
F. KELLER

1,925,325

RECORDER

Filed June 12, 1931

3 Sheets-Sheet 1



Inventor:

F. Keller

Sept. 5, 1933.

F. KELLER

1,925,325

RECORDER

Filed June 12, 1931

3 Sheets-Sheet 2

Fig. 2a

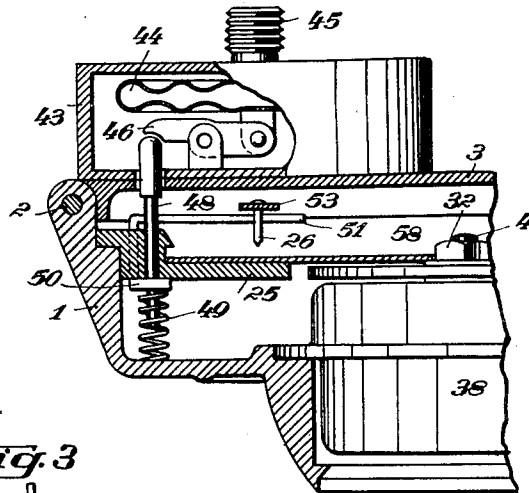


Fig. 3

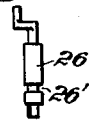
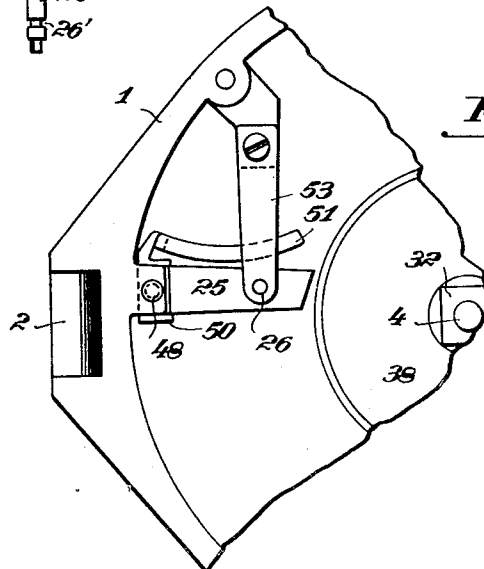


Fig. 1a



Inventor:

F. Keller

Sept. 5, 1933.

F. KELLER

1,925,325

RECORDER

Filed June 12, 1931

3 Sheets-Sheet 3

Fig. 4

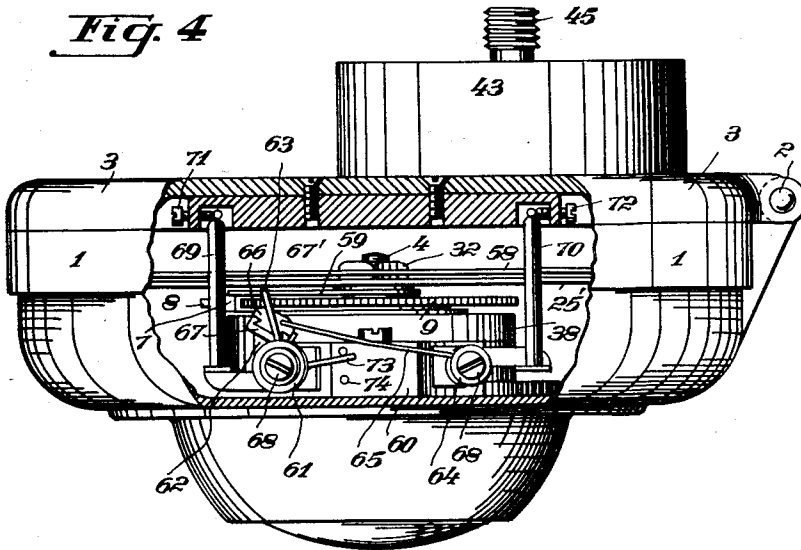


Fig. 6

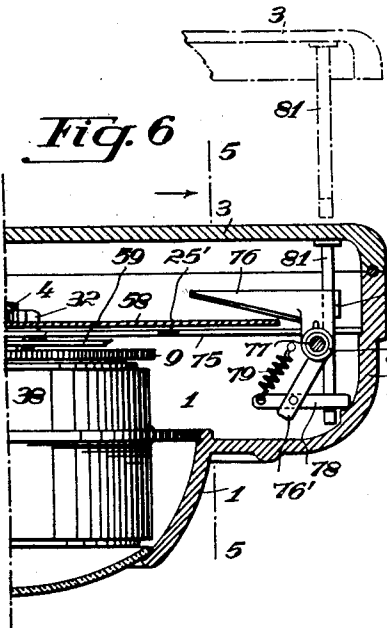
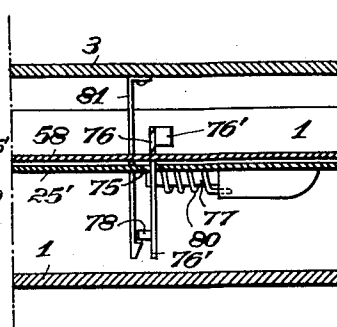


Fig. 5



Inventor:

F. Keller

UNITED STATES PATENT OFFICE

1,925,325

RECORDER

Fritz Keller, Charlottenburg, Germany, assignor
to the firm of Deuta-Werke vorm. Deutsche
Tachometerwerke G. m. b. H., Berlin Germany

Application June 12, 1931, Serial No. 543,879, and
in Germany April 30, 1930

4 Claims. (Cl. 234-1)

The invention relates to a recorder especially for vehicles, having a pendulum subjected to vibrations when the vehicle or the like is moving. The vibrating pendulum traces a zigzag line on a registering sheet rotated by a clock-work.

The object of the invention is to improve the recorder of the above kind and to obtain records not only dependent upon the pendulum but also upon another factor, for instance upon the driving motor. By this means the line traced on the registering sheet indicates not only the time of use of the vehicle but also the time of running the motor while the vehicle is at rest. Thus the driver is induced to stop the motor and to save fuel whenever the vehicle is at rest, for instance whenever the motor-boat is waiting before the flood-gate.

These and other features of the invention will be more apparent from the following description and the annexed drawings, in which

Fig. 1 is a plan view of the open cover of the new apparatus; Fig. 2 is a vertical section on the line 2-2 of Fig. 1; Figs. 1a and 2a are part views analogous to Figs. 1 and 2 of a modified construction; Fig. 3 shows a stylus; Fig. 4, 5, and 6 are vertical sections on the line 4-4 of Fig. 1, 5-5 of Fig. 6 and 6-6 of Fig. 1 respectively.

Referring first to Figs. 1 to 3, the back-plate 3 of the recorder is fixed to the body the conditions of which are to be recorded. The cover 1 is attached by means of the pivot 2 to the back plate 3. The back plate and the cover may be closed by a lock 82 against unauthorized opening of the instrument. All movable parts of the instrument are accommodated within the cover 1.

The clock 38 is centrally arranged in the cover 1. Its axis 4 rotates with the disc 6. On the margin of the disc 6 is guided the slide 7 carrying a pivoted pawl 8 engaging the teeth 9 of the disc 6. The slide 7 normally rotates with the disc 6 in the direction indicated by the arrow in Figure 1. Hereby the pawl 8 oscillates the lever 13 about the pivot 10 so that the tooth 15 of the lever is disengaged from the teeth of the segment 17 and the tooth 14 engages these teeth. By these means the segment 17 which is acted upon by spring 18 is allowed to swing for one or two teeth only every time the lever 13 is oscillated by the pawl 8. The swinging movement of the segment 17 is transmitted to the knee-lever 21, 22 engaging by means of the pin 20 into the somewhat larger slot 19 of the segment. The knee-lever 21, 22 and the pendulum 28 are fastened to axis 12. The vibrations of the pendulum are transmitted to the said knee-lever the free end

of which carries the stylus 26. The stylus is pressed by a spring 53 engaging its collar 26' against the record-disc 58 of paper-board or the like. The record-disc 58 is supported by plates 25, 25' and is rotated by the quadrant 32 fastened to the clock-shaft 4. All these are constructed and arranged as described in detail in the British Patent No. 328,816.

According to the invention the stylus 26 is not only controlled by the knee-lever 21, 22 or the pendulum 28 but also by the lever 40. This lever has at one end a slot 40' engaged by the free-crank-end of the stylus and at the other end a wedge-shaped part 47 cooperating with the bolt 46'. This bolt is acted upon by the lever 46 attached to the metallic-bellow 44 arranged in the housing 43 and communicating by the nipple 45 with the suction duct of the motor. If the motor is running its suction creates a vacuum within the bellow the contraction of which causes the bolt 46' to be pushed against the wedge 47 of the lever 40. The lever 40 is held by the spring 41 in its forward position and is pressed back by the bolt 46'. By this movement the lever 40 imparts to the stylus 26 a turn of about 90° as the upper end of the stylus has the form of a crank. The lower edge of the stylus has a sharp edge. If the edge has the direction of the rotation the stylus traces a thin line, but if the edge is positioned to cross this direction the stylus traces a thick line. It is therefore evident that with the arrangement described a thick recording line will be traced whenever the motor is running. If the vehicle is in motion the thick line will also show the zigzag form. As soon as the suction of the motor ceases the bellow 44 assumes automatically the shown extended position and only a thin line is traced on the rotating record-sheet.

In the modification shown in Figs. 1a and 2a the stylus 26 is fastened to the flat spring 53 tending to keep the stylus in contact with the record sheet 58 supported by the plate 25. But the spring 53 is adapted to be raised out of contact with the record-sheet 58 by the arm 51 of the stirrup 50 guided in the plate 25. The spring 49 is strong enough to overcome the spring 53 and keep the stylus normally away from the record-sheet. But if the motor is running and the bellow 44 is contracted the lever 46 pushes by means of the bolt 48 the stirrup 50 down so as to release the spring 53 to bring the stylus 26 into contact with the revolving record-sheet 58. With this embodiment of the invention the stylus traces records only when the motor is running. If the vehicle is in motion the stylus is also subjected to

the vibrations of the pendulum and the traced lines show the zigzag form.

The instrument shown is provided with a device adapted to cause an audible or visible signal in a predetermined time. Thus the instrument does not only record the operation of a moving body but gives also signals to the attendant to intervene with the operation of the said body, for instance for stopping its movement or the like.

To this end an arm 59 is put upon the quadrant 32 to rotate with the axis of the clock to switch in an electrical current of the signal after a certain time is elapsed. On the inside of the cover 1 is arranged a block 60 of an insulating material.

To the block 60 is fastened a rotatable roller 61 provided with a short horizontal contact pin 62 and vertical arm 63. A second roller 64 carries on the end of the spring 65 a contact piece 66 with an insulating wall 67. The contact piece 66 is provided with a contact pin 67' adapted to come into contact with the pin 62 of the rotatable roller 61. The fastening screws 68 of the rollers connected by the leads 69, 70 to the insulated screw terminals 71, 72 in the back-plate 3 in such a manner as to make or break the contact by closing or opening of the cover 1. The yielding end 59' of the revolving arm 59 engages the arm 63 and oscillates the roller 61 to bring the pins 62, 67 into electrical contact. By this means the circuit of the signalling device is closed. To bring this device back into its initial position the instrument is opened and the arm 63 is swung back by hand. The oscillation of the roller 61 is limited by the arm 73 abutting against the stops 74.

The record sheet once used is so mutilated as to exclude any dishonest further use. To this end a knife 76 is pivoted at 77, see Figs. 5, 6 adapted to cooperate with a slot 75 of the supporting plate 25' to slit the record sheet, when opening the instrument. It is known to slit the margin of the record sheet, but in the present instance the cut extends into the path of the stylus, which is thus hindered by the cut to continue its movement.

A lever 78 is pivoted to the arm 76' of the knife 76. The lever 78 is normally kept by the spring 79 in locking contact with the wall of the cover 1. A spring 80 on the pivot 77 tends to impart to the knife the cutting movement. To the back-

plate 3 is fastened a hooked spring-lever 81. When the instrument is closed the spring-lever yields laterally and its hook engages underneath the lever 78. But when the instrument is opened the said hook raises the locking lever 78 and the spring 80 is free to impart to the knife the cutting movement. Instead of the cutting a perforating or stamping may be used for the same purpose provided it is made on the record sheet within the area over which the stylus is riding. The knife 76 has a side projection 76' adapted to be grasped by the fingers in order to be brought back into the shown position wherein it is locked by the lever 78 owing to the spring 79. When the instrument is again closed the hooked lever engages underneath the lever 78.

What I claim is:

1. In a recording instrument arranged in a closed casing, the combination with a pendulum and a marking instrument operated by the vibrations of the pendulum, of means within the casing independent from the pendulum adapted to modify the operation of the said marking implement while the instrument is closed.

2. In a recording instrument arranged in a closed casing, the combination with a pendulum and a marking instrument operated by the vibrations of the pendulum, of means within the casing independent from the pendulum adapted to modify the mark when the motor plant is operating.

3. In a recording instrument arranged in a closed casing, the combination with a pendulum, a record sheet, and an instrument operated by the vibrations of the pendulum to make marks on the sheet, of means within the casing associated with a motor plant to modify the working contact of the instrument and the said sheet when the said plant is operating.

4. In a recording instrument arranged in a closed casing, the combination with a pendulum, a record sheet, and an instrument operated by the vibrations of the pendulum to make marks on the sheet, of means within the casing associated with a motor plant to modify the working contact of the instrument and the said sheet by the suction of the motor.

FRITZ KELLER.