

March 20, 1956

K. MEER

2,739,031

GRAPHICAL RECORDING DEVICE

Filed March 25, 1953

5 Sheets-Sheet 1

FIG. 1

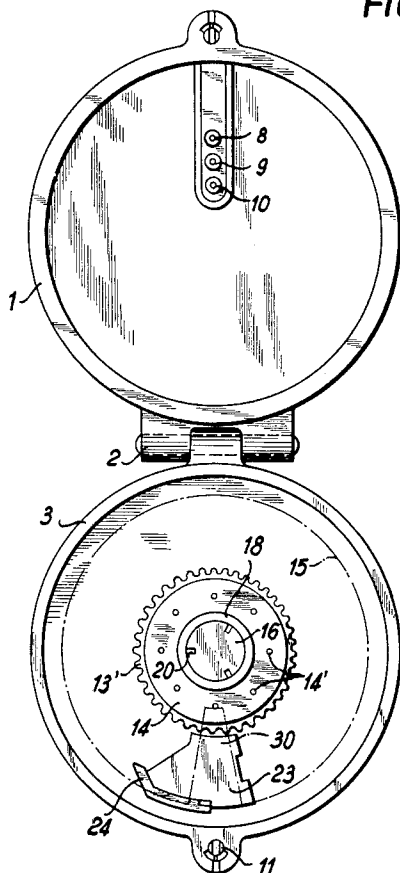


FIG. 3

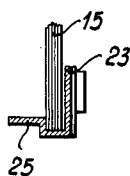
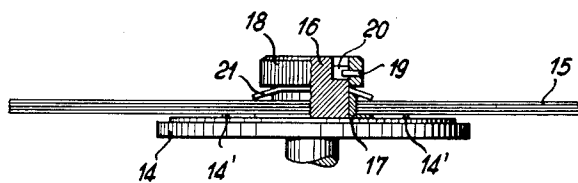


FIG. 2



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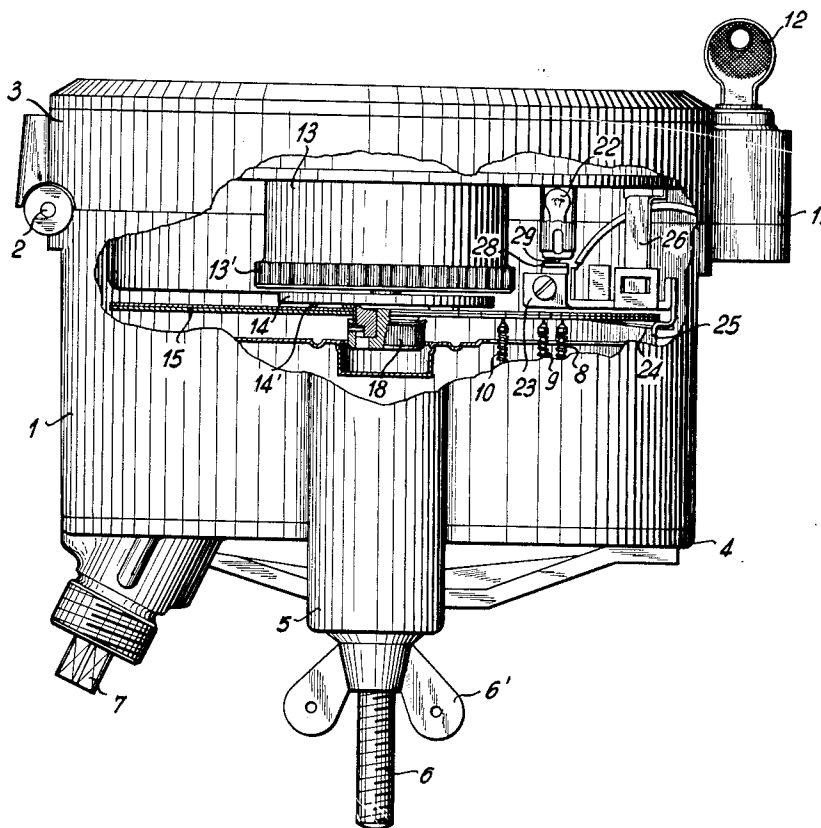
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FIG. 4



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FIG. 5

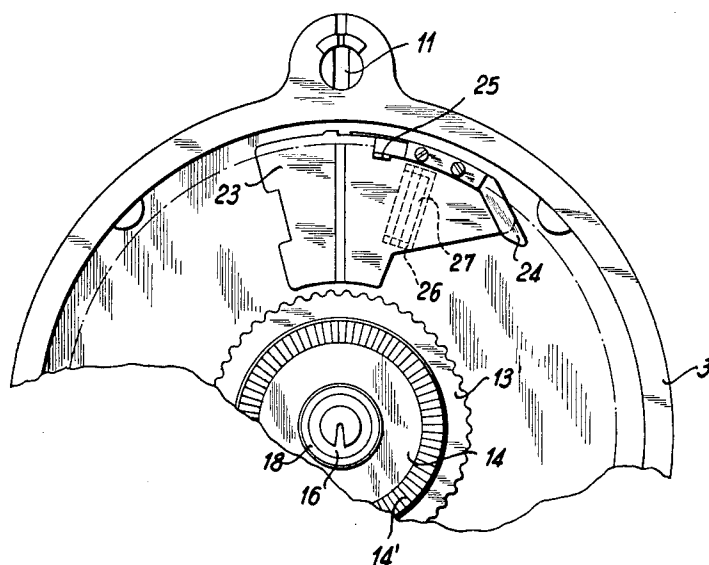
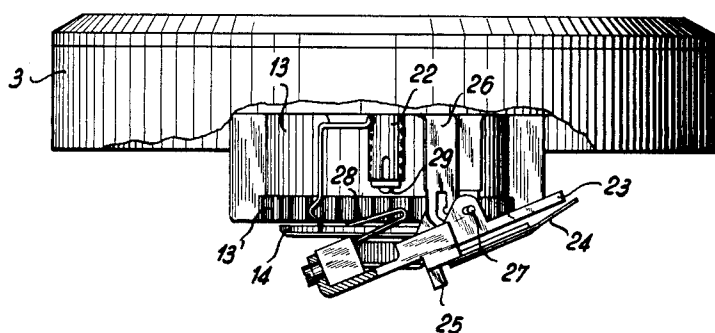


FIG. 6



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GRAPHICAL RECORDING DEVICE

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FIG. 8

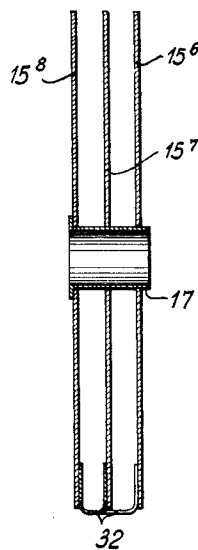
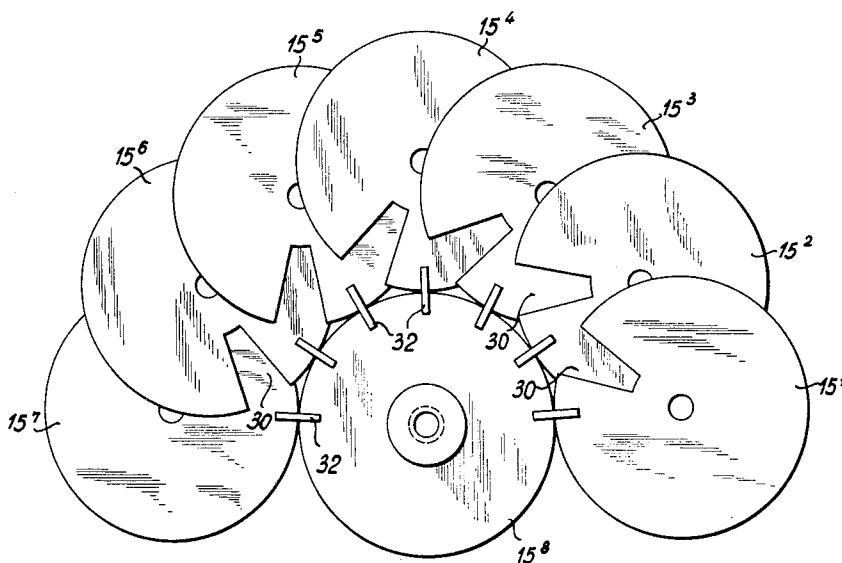


FIG. 7



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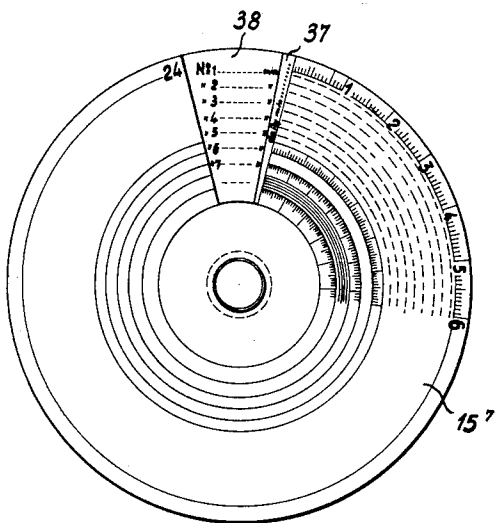
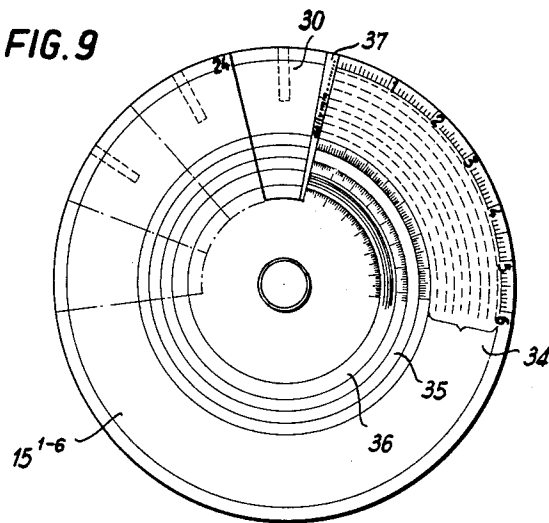
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GRAPHICAL RECORDING DEVICE

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5 Sheets-Sheet 5



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GRAPHICAL RECORDING DEVICE

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Application March 25, 1953, Serial No. 344,633

Claims priority, application Germany April 1, 1952

10 Claims. (Cl. 346—121)

The present invention relates to graphical recording devices, and more particularly to a tachograph for recording the distance covered by a vehicle during a day, the time required for stops, the speed of the vehicle, and similar data.

Tachographs comprise measuring means connected by a bendable shaft to the drive of the vehicle and move writing points in radial direction over rotating writing sheets which are driven by a clock motor. For the purpose of checking a trip of several days, a plurality of writing sheets are provided, each writing sheet corresponding to a day of the trip. After each revolution of the pile of writing sheets, the completed top sheet is removed, and the recording is continued on the next writing sheet.

Consequently, frequent access to the writing sheets is necessary, and in the known constructions it is difficult to remove and insert writing sheets since the same are located between the clock motor, and a support on one hand, and the writing points on the other hand.

It is the object of the present invention to overcome the disadvantages of the known graphical recording devices and to provide an arrangement permitting separation of the writing sheets from the writing points.

It is another object of the present invention to provide a housing for a graphical recording device consisting of two separable housing halves which are joined in an operating plane in which the writing sheets and the writing points are located.

It is a further object of the present invention to provide means for attaching a plurality of superimposed writing sheets to a base sheet by means of tape pieces provided with an adhesive only on one side thereof.

It is a still further object of the present invention to provide a knife in the part of the housing which supports the writing sheets, such knife separating the completed writing sheets from the blank sheets by cutting the tape pieces.

With these objects in view the present invention mainly consists in a graphical recording device, and comprises, in combination, a first supporting means, a rotary support rotatably mounted in the first supporting means, drive means located in the first supporting means for rotating the rotary support, the rotary support having a transverse supporting face located in an operating plane, means for securing writing sheets to the supporting face of the rotary support for rotating in the operating plane, a second supporting means, measuring means secured to the second supporting means, movable writing means mounted on the second supporting means and actuated by the measuring means, the movable writing means having writing point means for writing on the sheets, and attaching means separably attaching the first supporting means to the second supporting means with the writing point means located in the operating plane so that when the first and second supporting means are separated, the writing means and the rotary support are separated and the writing sheets are easily accessible.

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According to a preferred embodiment of the present invention a circular base sheet member is connected to a plurality of superimposed writing sheets by means of tape pieces, and the writing sheets are provided with sector shaped cut outs which are progressively staggered in one direction so that a knife secured to the first supporting means consecutively passes through the cut outs in the writing sheets and cuts the tape which connects a completed sheet with the base sheet member. The completed writing sheet is stopped, while the writing point projects through the sector-shaped cut out in the completed sheet and slides on the rotating adjacent blank sheet.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantage thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings, in which:

Fig. 1 is a front view of an opened tachograph according to the present invention;

Fig. 2 is a side view of a detail partly in section;

Fig. 3 is a fragmentary sectional view of a detail;

Fig. 4 is a side view of a tachograph according to the present invention, portions of the casing being broken away;

Fig. 5 is a fragmentary front view of the movable part of the housing;

Fig. 6 is a side view of the movable part of the housing;

Fig. 7 is a plan view showing the connection between the writing sheets and the base sheet member;

Fig. 8 is a side view showing the arrangement of the tape pieces connecting the writing sheets to the base sheet member;

Fig. 9 is a plan view of a writing sheet; and

Fig. 10 is a plan view of the last writing sheet.

Referring now to the drawings, and more particularly to Figs. 1 and 4, the tachograph according to the present invention consists of a first housing or supporting means 3 which is attached by suitable attaching means, such as the hinge means 2 to a second housing or supporting means 1 and can be pivoted between the open position shown in Fig. 1 and the closed position shown in Fig. 4. The pivoted lid 3 can be locked by a lock 11 operated by the key 12.

The tachograph can be secured by means of the member 5, the spindle 6 and the wing nut 6' to the dash board of the vehicle. The measuring means, not shown, for measuring the speed of the vehicle and the distances covered by the same are secured to the rear wall 4 of the housing portion 1, and are connected through the connecting shaft 7, and a bendable shaft, not shown, to the drive of the vehicle. This driving arrangement for the measuring means is not an object of the present invention and therefore not shown. The measuring means actuate writing means 8, 9 and 10, and preferably one writing point is provided for recording the speed, one writing point for recording the mileage, and one writing point for recording stops.

In the lid part 3 of the housing a clock motor 13 is arranged which is wound up by the ring 13'. The clock motor operates clock hands which are arranged on the front face of the lid, not shown, and also drives a rotary support 14 on which the writing sheets 15 are supported.

The rotary support 14 is provided with a center pin 16, see Fig. 2, which passes through holes in the circular writing sheets 15 which are arranged on a sleeve member 17. A knob 18 has a pin 19 which projects into a helical slot 20 in the center pin 16 so that the spring 21 is compressed when the button is rotated whereby the writing sheets are pressed against the rotary support 14 so that

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small needle points 14' enter the bottom sheet and non-rotatably secure the pile of writing sheets to the rotary support 14.

Since the writing sheets 15 project beyond the edge of the rotary supporting member 14, a writing support 23 is provided which has a face portion arranged opposite the writing points 8, 9 and 10 for supporting the writing sheets. Preferably the writing support 23 is pivotally mounted on a pivot pin 27 by means of an extension 26 so that the supporting member 23 can be pivoted into an inoperative position in which the signal lamp 22, which indicates high speed, is easily accessible. A contact spring 28 is secured to the writing support 23 electrically insulated therefrom and is connected to a battery by means of a flexible wire, not shown. The contact 28 engages the middle contact 29 of the signal lamp 22, while the socket thread of the lamp 22 is connected to the other terminal of the battery.

Since the writing sheets 15 are supported by the rotary support 14 and by the writing support 23 in an operating plane in which the writing points 8, 9 and 10 are located, the radial movements of the writing points due to the movement of the measuring means produces a graph on the top sheet of the rotating pile of sheets 15.

If the lid 3 is pivoted about the hinge pin 2 to an open position, as shown in Fig. 1, the writing points 8, 9 and 10 are separated from the sheets 15, and the knob 18 can be easily operated for removing and inserting writing sheets.

In order to permit a continuous operation, the writing sheets 15¹ to 15⁷ are secured to a base sheet member 15⁸ by pieces of tape 32, as shown in Figs. 7 and 8. All writing sheets, except the last sheet 15⁷, are provided with sector-shaped cut outs 30, and as shown in Fig. 7 the writing sheets are first arranged about the base sheet member 15⁸, which also has no cut out and does not serve recording purposes. Each writing sheet is connected by a piece of tape 32 adjacent to the cut out therein to the base sheet member 15⁸, so that when the staggered writing sheets 15¹ to 15⁷ are pivoted about the associated tape, all writing sheets 15¹ to 15⁷ form a pile, in the manner shown in Fig. 8 for two writing sheets. It will be understood that in this pile of writing sheets the cut outs 30 will be progressively staggered in one direction.

When a pile of writing sheets together with the supporting sheet member 15⁸ is placed on the center pin 16 and on the rotary support 14, the knife member 24 projects into the region of the cut outs and slides on the writing sheets in the operating plane. When after each revolution of the rotary support 14 a graph has been completed on a writing sheet, the knife 24 passes through the sector-shaped cut out 30 in the completed writing sheet onto the writing sheet directly below it and cuts the tape piece 32 connecting the same with the completed writing sheet. The completed writing sheet passes over the knife and is stopped by the stop 25, which is secured to the stationary supporting member 23 and projects into the cut out 30 of the completed writing sheet, as shown in Figs. 1 and 3. The writing points 8, 9, and 10 are now located in the cut out 30 of the completed and stopped writing sheet and slide on the next following writing sheet which is rotated by the rotary support 14. This operation is continued until the lowermost writing sheet 15⁷ is completed, which is not provided with a cut out whereupon the apparatus is stopped.

The arrangement of the writing sheets and of the supporting sheet member 15⁸ is particularly advantageous since the tape pieces 32 need only an adhesive coating on one side, and since the writing sheets can be arranged in the position shown in Fig. 7 by means of a pattern so that the production of the exchangeable pads of writing sheets supported on the sheet member 15⁸ can be carried out on machines while the cut outs are arranged in the finished pad of writing sheets in the required staggered position.

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As shown in Figs. 9 and 10, the writing sheets are provided with additional areas 37 in which descriptive material such as the mileage registered on the respective writing sheet may be entered by the driver. The area 34 is provided for registering the speed, the area 35 is provided for registering the driving and stopping times, and the area 36 for registering the mileage.

On the lowermost writing sheet 15⁷ an additional sector-shaped area 38 is provided on which the mileage found on all writing sheets and noted on the respective writing sheets may be entered and added. Suitable lines and other printed indications may be provided on the writing sheets.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of graphical recording devices differing from the types described above.

While the invention has been illustrated and described as embodied in a tachograph having a housing separable in an operating plane in which the writing sheets and the writing points are located, it is not intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

What is claimed as new and desired to be secured by Letters Patent is:

1. A tachograph recording device, comprising in combination, a first supporting means; a rotary support rotatably mounted in said first supporting means; drive means located in said first supporting means for rotating said rotary support, said rotary support having a transverse supporting face located in an operating plane; a circular base sheet member supported on said supporting face; a plurality of circular superimposed writing sheets superimposed on said base sheet member and having the same diameter as the same, each of said writing sheets with the exception of the writing sheet located adjacent said base sheet member being formed with a sector-shaped cut out, said sector-shaped cut outs being progressively staggered in one direction; a plurality of tape pieces, each tape piece secured at one end thereof to said base sheet member at equally spaced points adjacent the perimeter of the same, and secured at the other end thereof to one of said writing sheets adjacent the segment-shaped cut out in the same; holding means for securing said superimposed writing sheets and said base sheet member to said supporting face of said rotary support for rotation in said operating plane; a knife member secured to said first supporting means and located in said operating plane, said knife member projecting inwardly in radial direction into the region of said cut outs so as to pass successively through the cut out of each writing sheet and onto the adjacent writing sheet during rotation of said rotary support and to cut one of said tape pieces after each revolution for separating completed writing sheets from blank writing sheets; a stop on said knife member passing through the cut out of the last completed writing sheet and engaging and arresting the latter, completed and arrested writing sheets being held by said holding means immovable on said rotary support; a second supporting means; measuring means secured to said second supporting means; movable writing means mounted on said second supporting means and actuated by said measuring means, said movable writing means having writing point means for writing on writing sheets rotating with said rotary supporting means and adapted to project through

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the cut outs of completed and arrested writing sheets; and attaching means separably attaching said first supporting means to said second supporting means with said writing point means located in said operating plane so that when said first and second supporting means are separated, said writing means and said rotary support are separated and said writing sheets are easily accessible.

2. A tachograph comprising, in combination, a first housing means; a rotary support rotatably mounted in said first housing means; drive means located in said first housing means for rotating said rotary support, said rotary support having a transverse supporting face located in an operating plane; a circular base sheet member supported on said supporting face; a plurality of circular superimposed writing sheets superimposed on said base sheet member and having the same diameter as the same, each of said writing sheets with the exception of the writing sheet located adjacent said base sheet member being formed with a sector-shaped cut out, said sector-shaped cut outs being progressively staggered in one direction; a plurality of tape pieces, each tape piece secured at one end thereof to said base sheet member at equally spaced points adjacent the perimeter of the same, and secured at the other end thereof to one of said writing sheets adjacent the segment-shaped cut out in the same; resilient holding means for securing said superimposed writing sheets and said base sheet member to said supporting face of said rotary support for rotation in said operating plane; a writing support pivotally mounted in said first supporting means and having a face portion located in said operating plane and adapted to support the writing portions of the sheets; a knife member secured to said writing support and located in said operating plane, said knife member projecting inwardly in radial direction into the region of said cut outs so as to pass successively through the cut out of each writing sheet and onto the adjacent writing sheet during rotation of said rotary support, and to cut one of said tape pieces after each revolution for separating completed writing sheets from blank writing sheets; a stop on said knife member passing through the cut out of the last completed writing sheet and engaging and arresting the latter, completed and arrested writing sheets being held by said holding means immovable on said rotary support; a second housing means; measuring means secured to said second housing means; movable writing means mounted on said second housing means and actuated by said measuring means, said movable writing means having writing point means for writing on writing sheets rotating with said rotary supporting means and adapted to project through the cut outs of completed and arrested writing sheets; and hinge means pivotally attaching said first housing means to said second housing means with said writing point means located opposite said face portion of said writing support and in said operating plane so that when said first and second housing means are opened by pivoting said first housing means, said writing means and said rotary support are separated and said writing sheets are easily accessible.

3. A device as claimed in claim 1 wherein said tape pieces are provided with an adhesive coating on one side only, are bent to be U-shaped, and adhere to said base sheet member and to said writing sheets, respectively.

4. A tachograph device, comprising, in combination, a first supporting means; a rotary support rotatably mounted in said first supporting means; drive means located in said first supporting means for rotating said rotary support; a plurality of superimposed writing sheets, each writing sheet being formed with a sector-shaped cut-out, said sector-shaped cut-outs being progressively staggered in one direction; a plurality of tape pieces for connecting said writing sheets and being secured to each of said writing sheets adjacent the cut-out in the same; holding means for securing said superimposed writing

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sheets to said rotary support located in an operating plane; a knife member secured to said first supporting means and located in said operating plane, said knife member projecting in radial direction into the region of said cut-outs so as to pass successively through the cut-out of each writing sheet and onto the adjacent writing sheet during rotation of said rotary support for cutting one of said tape pieces after each revolution for separating completed writing sheets from blank writing sheets; a stop on said knife member passing through the cut-out of the last completed writing sheet and engaging and arresting the latter, completed and arrested writing sheets being held by said holding means and remaining on said rotary support; a second supporting means; measuring means secured to said second supporting means; movable writing means mounted on said second supporting means and actuated by said measuring means, said movable writing means having writing point means for writing on the writing sheets rotating with said rotary supporting means and adapted to project through the cut-outs of completed and arrested writing sheets; and attaching means attaching said first supporting means to said second supporting means with said writing point means located in said operating plane.

5. A tachograph as claimed in claim 4 wherein said rotary support includes a center pin, wherein said writing sheets are formed with a center opening, said center pin passing through said center openings; and wherein said holding means includes a spring mounted on said center pin, and a knob mounted on said center pin adjustable in axial direction of the same for pressing said spring against said superimposed writing sheets.

6. A tachograph as claimed in claim 5 wherein said center pin has an end portion projecting from said superimposed writing sheets and being formed with a helical groove, and wherein said knob includes an inwardly projecting pin engaging said helical slot so that rotation of said knob causes axial movement of said knob for pressing said spring against said writing sheets.

7. A tachograph as claimed in claim 4 wherein said writing sheets are provided with concentric surface areas located opposite said writing point means and adapted to receive graphical recordings of speed and mileage, and wherein each writing sheet is provided with a sector-shaped writing area adapted to receive a notation concerning the mileage recorded on the respective writing sheet.

8. A tachograph as claimed in claim 2 wherein each of said writing sheets is provided with a sector-shaped writing area adapted to receive notation concerning the mileage graphically recorded on the respective writing sheet, and wherein said base sheet member is provided with a sector-shaped writing area adapted to receive a notation concerning the total of the mileages graphically recorded on said writing sheets.

9. For use in a graphical recording device, in combination, a circular base sheet member; a plurality of superimposed writing sheets superimposed on one side of said base sheet member, each of said writing sheets with the exception of the writing sheet located adjacent said base sheet member being formed with a sector-shaped cut-out, said sector-shaped cut-outs being progressively staggered in one direction; a plurality of tape pieces, each tape piece having an adhesive coating on one side only, said tape pieces being bent to be U-shaped, each tape piece being adhesively attached at one end thereof with said one coated side to said one side of said base sheet member at equally spaced points adjacent the perimeter of the same, each tape piece being secured at the other end thereof to one of said writing sheets adjacent the segment-shaped cut-out in the same, and being adhesively attached with said one coated side thereof to a side of the respective writing sheet facing said base sheet member.

10. A tachograph as claimed in claim 2 and including

a signal lamp having a contact at one end thereof; and a contact means secured to said writing support electrically insulated therefrom and engaging said contact of said signal lamp in normal position of said writing support, and being separated from said contact when said writing support is pivoted to an inoperative position. 5

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