

July 24, 1962

E. F. DONOVAN

3,045,908

SLIDE CALCULATOR

Filed Feb. 24, 1959

2 Sheets-Sheet 1

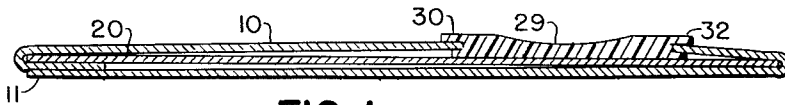


FIG. 1

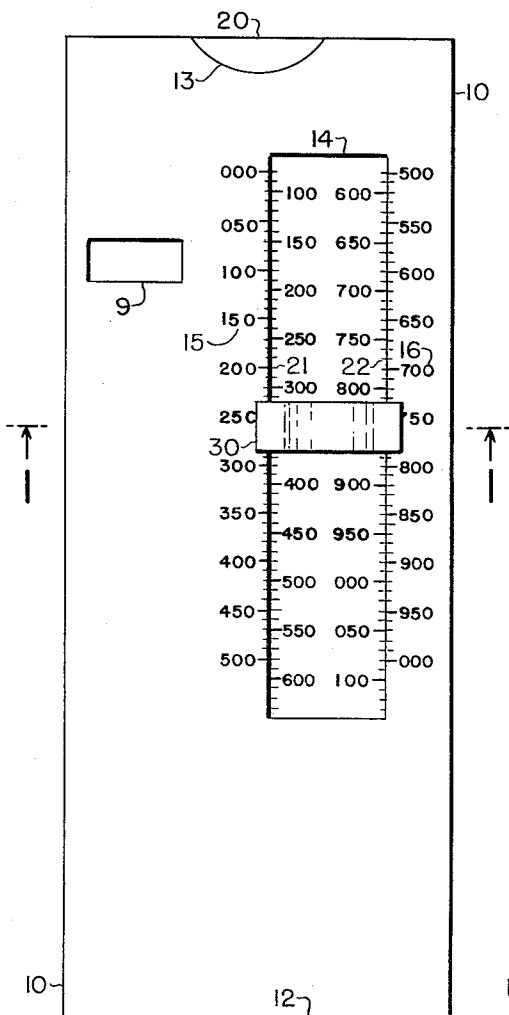


FIG. 2

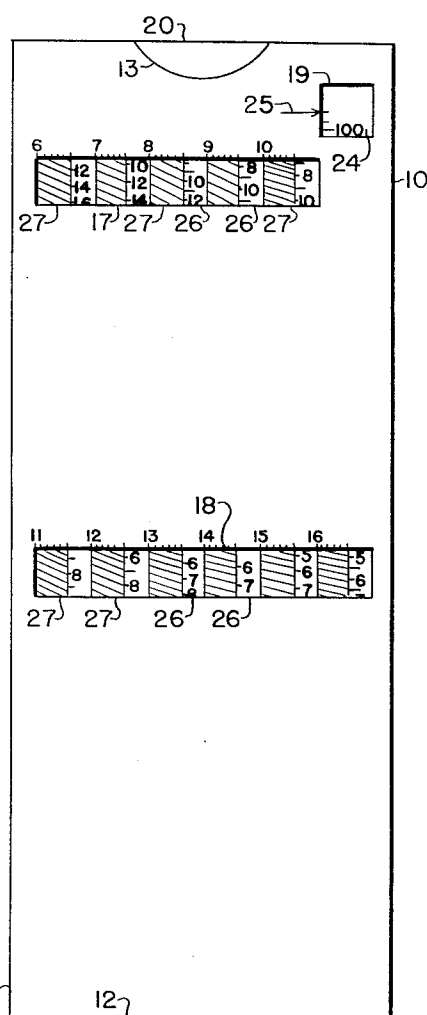


FIG. 3

INVENTOR:
EDWARD F. DONOVAN
BY *Peter L. Tailer*
AGENT

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2 Sheets-Sheet 2

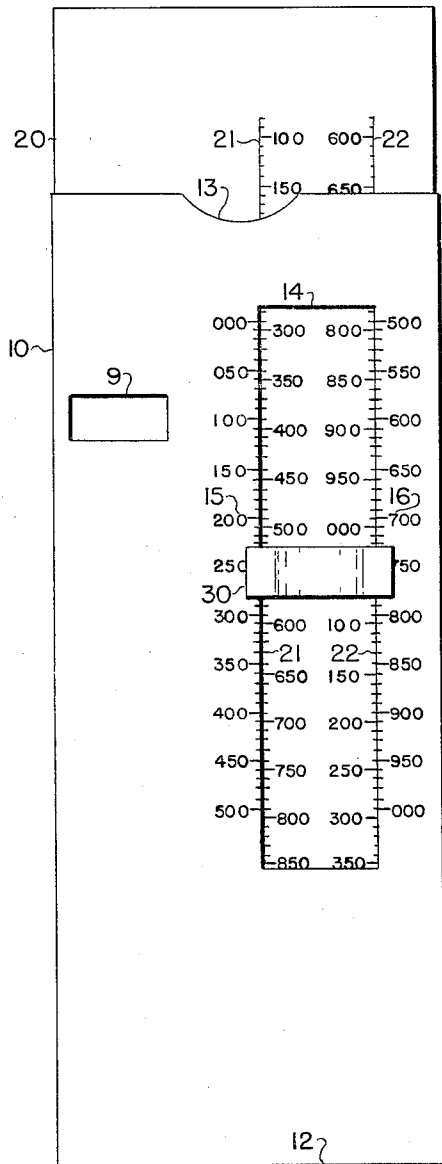


FIG. 4

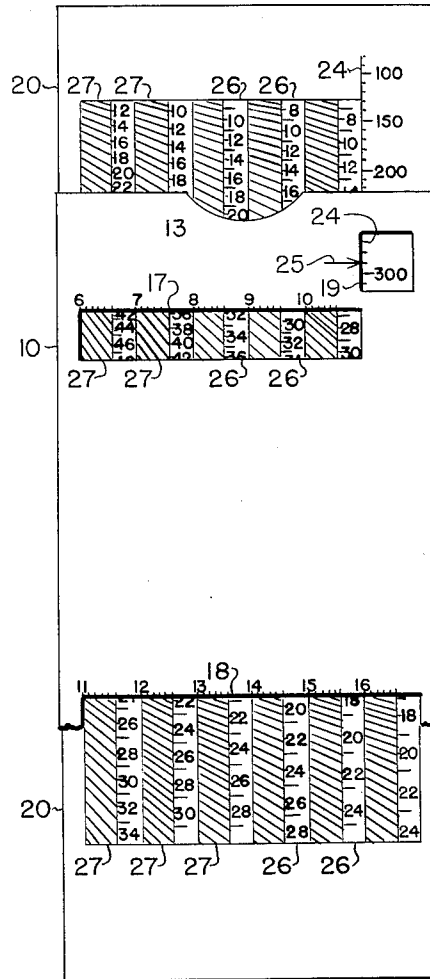


FIG. 5

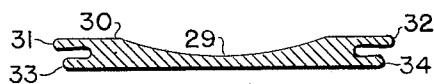


FIG. 6

INVENTOR:
EDWARD F. DONOVAN
BY *Peter L. Taylor*
AGENT

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3,045,908

SLIDE CALCULATOR

Edward F. Donovan, 37 Calton Road,
New Rochelle, N.Y.

Filed Feb. 24, 1959, Ser. No. 794,896
8 Claims. (Cl. 235-89)

This invention relates in general to slide calculators and, more particularly, to calculators that compute the gasoline consumption of automobiles in miles traveled per gallon of fuel used.

An object of this invention is to provide a miles per gallon fuel consumption calculator which is easier to operate and use because it calculates the number of miles traveled and the fuel consumption in one combined operation.

Another object of this invention is to provide a fuel consumption calculator which is more accurate in that it allows interpolation from fractions of gallons of gas purchased to fractions of miles per gallon consumed.

Yet another object of this invention is to provide a superior indicator to be set within an opening cut in a sheet of paper, cardboard, or plastic which will slide easily along the opening without twisting and which will remain firmly in any set position when not in use.

Still another object of this invention is to provide a fuel consumption slide calculator which will calculate the number of miles traveled between stops to fill the gas tank, indicate the number of miles so traveled, and indicate, within one or more windows, the gasoline consumption in miles per gallon.

Additional objects, advantages, and features of invention reside in the particular construction, combination, and arrangement of parts involved in the embodiment of the invention and its practice otherwise as will be understood from the following description and accompanying drawings wherein:

FIG. 1 is a cross-section taken on line 1-1 in FIG. 2;

FIG. 2 is a front view of the slide calculator in the closed position;

FIG. 3 is a back view of the slide calculator in the closed position;

FIG. 4 is a front view of the slide calculator with the slide partially withdrawn to perform a calculation;

FIG. 5 is a back view of the slide calculator with the slide partially withdrawn to perform a calculation and with the lower portion of the envelope broken away; and

FIG. 6 is a cross-section through the indicator.

Referring to the drawings in detail, FIGS. 1, 2, and 3 show the construction of my invention. An elongated envelope 10 is formed by folding over a piece of heavy glazed paper, cardboard, or stiff plastic and gluing or otherwise fixing it at the flap 11 so that the resulting seam is not obvious. The envelope 10 may be closed at the bottom 12 although this is not necessary. Within the envelope 10, there is disposed the slide 20 which is formed of the same material and fits snugly within it. A finger notch 13 allows the slide to be easily grasped so that it can be withdrawn from the envelope.

An elongated opening 14 extends parallel to the length of the envelope. On one side of the opening 14 there are inscribed miles from 000 to 500 in suitable scaled intervals 15 and on the other side there are inscribed in like intervals 16 miles from 500 to 000. As may be further seen in FIG. 2, two scales 21 and 22 on the slide 20 correspond in equal units with the scales 15 and 16 on the envelope. However when the slide 20 is completely within the envelope 10, 000 on the scale 15 corresponds with 080 miles on the 21 scale just as 500 on the scale 16 corresponds with 580 on the 22 scale. Thus in the closed position each position on the mileage scales 15 and 16 has a value next to it 80 miles greater on the scales 21 and 22. Any

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number of windows may be provided in the front of the envelope 10 similar to the window 9 so that advertising or other printed matter on the slide 20 becomes visible through it as the slide is withdrawn.

Fixed within the opening 14 is the indicator 30. As shown in FIGS. 1, 2, and 4, this indicator 30 may be slid along in the opening 14 so that its top part will register any position on the scales 15 and 16. FIG. 6 further shows that the indicator has a lower center portion 29. When a finger is laid on the indicator to slide it along the opening, this lower portion 29 naturally guides the finger to the center of the indicator so that it may be slid along evenly without cocking or twisting within the opening 14. The upper projections 31 and 32 of the indicator extend further out than the lower projections 33 and 34. This renders the assembly of the calculator easier as one side of the indicator may be seated about the center of one edge of the opening 14 whereon the other edge can be raised upward until a lower projection falls below it and the tip of an upper projection rests on it. The edge is then released and the indicator becomes seated as shown in FIG. 1. If the indicator is cut from an extruded length of plastic such as polyethylene which is slightly elastic, the upper and lower projections may be made to converge so that they must be forced apart by the entry of the edges of the opening 14. The projections then grip the edges of the opening 14 to keep the indicator from moving accidentally after it has been set in a given position. However, a moderate finger pressure will still slide it smoothly along. It should be noted that an indicator should not span an opening more than three times its width or the indicator may twist or cock within it.

As may be seen in FIG. 3, two elongated slots are cut crosswise in the back of the envelope 10. Along the upper edges of these slots, which are designated 17 and 18, there are printed figures representing gallons of gasoline with each gallon divided into a scale of intervals of two tenths of a gallon. Each scale representing a gallon of gasoline is separated from the one next to it by a small space. Also cut into the back of the envelope is the window 19 with its associated indicating arrow 25. Printed on the slide 20 is a mileage scale 24 which appears in the window 19. This scale is in the same units as the scales 15, 16, 21, and 22. When the slide is completely within the envelope, 80 miles on this scale 24 registers next to the indicating arrow 25. Through the slots 17 and 18 there may be seen the columns of figures 26 and the variously sloping lines 27. The sloping lines 27 fall directly under each scale of intervals representing a gallon of gasoline.

Using a hypothetical problem as an example, this calculator is used as follows. When the gas tank of an automobile is filled, the indicator 30 is moved along the opening 14 until its top corresponds on the scales 15 or 16 to the last three figures on the odometer. As shown in FIG. 2, the indicator is set as if the last three figures were 235 on the 15 scale or 735 on the 16 scale. The calculator is then placed in the glove compartment and left until gasoline is again purchased and the tank filled. At this time, the slide 20 is withdrawn until the scales 21 or 22 correspond to the last three figures which are then on the odometer. As shown in FIG. 4 as an example, 525 is set above the indicator as if these were the last three figures on the odometer. The calculator is then turned over and the total number of miles traveled appears in window 19 next to the arrow 25. In this case as shown in FIG. 5, 290 miles have been traveled. If ten gallons of gas were then purchased, the line from the ten above the slot 17 would be followed to the column of figures which lie to the right of the ten to show a fuel consumption of 29 miles per gallon. If 10.4 gallons of fuel had been required, the slope of the line from 10.4 would be followed to show a

fuel consumption of slightly less than 28 miles per gallon. In this manner the invention is used to calculate fuel consumption within the limits of the scales built into it.

As shown in FIG. 5, the scale of each column of figures 26 remains constant or the intervals between units in each column remain the same. For this reason there must be a variation in the slope of the lines 27 which are used to extrapolate from gallons or fractions of gallons to miles or fractions of miles per gallon. Also, for the same reason, the calculator reads in the closed position as if eighty miles had been traveled. Some such minimum figure must be set, otherwise the variation in the slope of the lines would be too great. The practical limits of the variation of the slope of the lines should lie between 10° and 75° if they are to be used for accurate extrapolation. Although it would be possible to construct this calculator with a constant slope of the lines 27, the column of figures 26 would have to then be compressed from one end to the other. This would render the reading of the values representing the miles traveled per gallon of fuel much more difficult as the scale would vary and confuse the average person.

There is an advantage in computing the miles traveled on the front of the calculator and reading the miles traveled on the back. If the user knows the number of miles traveled, he need only set this number in the window 19 next to the arrow 25 and read off his fuel consumption. Although the actual computation of the miles traveled is a simple subtraction, this invention saves the bothersome remembering or writing down of the first odometer reading as the indicator is placed on the last three figures of this reading. By doubling the scale on the front of the device, the total length required for the calculator is reduced. For this or other uses, a single scale or a quadruple scale could just as easily be used. While two slots 17 and 18 are shown, any number that was thought desirable could be provided with corresponding columns of figures 26 and sloping lines 27. It is understood that the particular arrangement and use of this invention may be altered or modified to read in other units and to be used for other purposes.

While I have disclosed my invention in the best form known to me, it will nevertheless be understood that this is purely exemplary and that modifications in the construction, arrangement, and combination of parts may be made without departing from the spirit of the invention, except as it may be more particularly limited in the appended claims wherein I claim:

1. A slide calculator comprising, in combination, an element of sheet material having at least one elongated slot formed crosswise in it, separated horizontal scales marked off in divisions of their length along a horizontal edge of each elongated slot, a slide mounted to move lengthwise below said element, a vertical scale on said slide so that said slide may be moved a given amount for a given value on said vertical scale, columns of figures on said slide appearing in each elongated slot in said element with each column of figures appearing in the elongated slot below and to one side of one of said separated horizontal scales, and columns of sloping lines on said slide appearing in each elongated slot below said separated horizontal scales, said sloping lines allowing interpolation from any point on said horizontal scales to a value on one of said columns of figures.

2. The combination according to claim 1 wherein said element is an envelope of sheet material and said slide fits slidably within it.

3. The combination according to claim 2 wherein each of said columns of figures has the figures in that column spaced the same distance apart and the slope of said sloping lines varies.

4. A slide calculator comprising, in combination, an envelope of sheet material having at least one elongated slot formed crosswise in it and having an elongated opening formed lengthwise in it, at least one vertical scale on said

envelope along the edge of the elongated opening, an indicator set within the elongated opening to indicate a value on the vertical scale, separated horizontal scales marked off in divisions of their length along a horizontal edge of each elongated slot, a slide movable lengthwise within said envelope, a vertical scale on said slide appearing within the elongated opening so that given values on the vertical scales may be juxtaposed at a position indicated by said indicator by moving said slide within said envelope a given amount, columns of figures on said slide appearing in each elongated slot in said envelope with each column of figures appearing in each elongated slot below and to one side of one of said separated horizontal scales and with each column of figures having the figures in that column spaced the same distance apart, and columns of variously sloping lines on said slide appearing in each elongated slot below said separated horizontal scales, said sloping lines allowing interpolation from any point on said horizontal scales to a value on one of said columns of figures.

5. The combination according to claim 4 wherein said elongated opening is formed in the front of said envelope and said at least one elongated slot is formed in the back of said envelope, and with the addition of a window formed in the back of said envelope and with the further addition of a vertical unit scale on the back of said slide so that the value of the difference of the juxtaposed values indicated on said vertical scales appears within the window on said vertical unit scale.

6. The combination according to claim 4 wherein said indicator is formed of flexible plastic having two upper projections extending outward on either side of said indicator, and two lower projections extending outward from said indicator below said upper projections with said upper and lower projections slightly converging to be forced apart by the edges of the elongated opening in said envelope.

7. The combination according to claim 4 wherein said indicator is formed of flexible plastic having two upper projections extending outward on either side of said indicator, and two lower projections extending outward from said indicator below said upper projections with said upper and lower projections slightly converging to be forced apart by the edges of the elongated opening in said envelope, said upper projections extending beyond said lower projections and said indicator being at least one third as wide as the elongated opening in said envelope.

8. A slide calculator for computing the number of miles per gallon delivered by gasoline used in an automobile, said slide calculator comprising, in combination, an envelope of sheet material open at the ends and having a first and a second side, said first side containing at least one elongated slot formed crosswise in said first side of said envelope and said second side of said envelope having an elongated opening formed lengthwise in said second side, at least one vertical scale on said second side of said envelope along one edge of the elongated opening, said vertical scale having successive figures which indicate readings of an automobile odometer at a first filling of the automobile gas tank, an indicator slidably set within the elongated opening in said second side of said envelope to indicate as a memory device a value on said vertical scale, separated horizontal scales marked off in divisions of their length along a horizontal edge of each elongated slot, each separated horizontal scale indicating a gallon and a fractional gallon of gasoline purchased at a second filling of the automobile gas tank, a slide having a first and a second side and being movable lengthwise within said envelope, a vertical scale on said first side of said slide appearing within the elongated opening in said second side of said envelope, said vertical scale on said first side of said slide having successive figures which indicate readings of the automobile odometer at a second filling of the automobile gas tank so that the second reading of the odometer at the second filling of

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the automobile gas tank indicated on said vertical scale on said slide may be juxtaposed to the position indicated by said indicator on said vertical scale on said second side of said envelope, said vertical scales being juxtaposed by moving said slide within said envelope, 5 columns of figures on said second side of said slide appearing in each elongated slot in said envelope with each column of figures appearing in each elongated slot below and to one side of one of said separated horizontal scales, said columns of figures in each column being spaced the 10 same distance apart and the figures in each column representing miles delivered per gallon of gasoline used in the automobile between the first and second fillings of the automobile gas tank, and columns of various sloping lines on said second side of said slide appearing in each elongated slot below said separated horizontal scales, said sloping lines each leading downward to a point on one of

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said columns of figures on said second side of said slide, said sloping lines allowing interpolation from any point on said horizontal scales representing a fractional gallon of gasoline which was purchased at the second filling of the automobile gasoline tank to a value on one of said columns of figures indicating the average number of miles traveled per gallon of gasoline purchased.

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