

[54] SPEED REGISTER

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[22] Filed: Sept. 15, 1969
[21] Appl. No.: 857,998

Related U.S. Application Data

[62] Division of Ser. No. 653,061, July 13, 1967, Pat. No.
3,473,731.
[52] U.S. Cl. 235/78, 235/88
[51] Int. Cl. G06c 27/00
[58] Field of Search. 235/78, 88, 89, 61, 70.2

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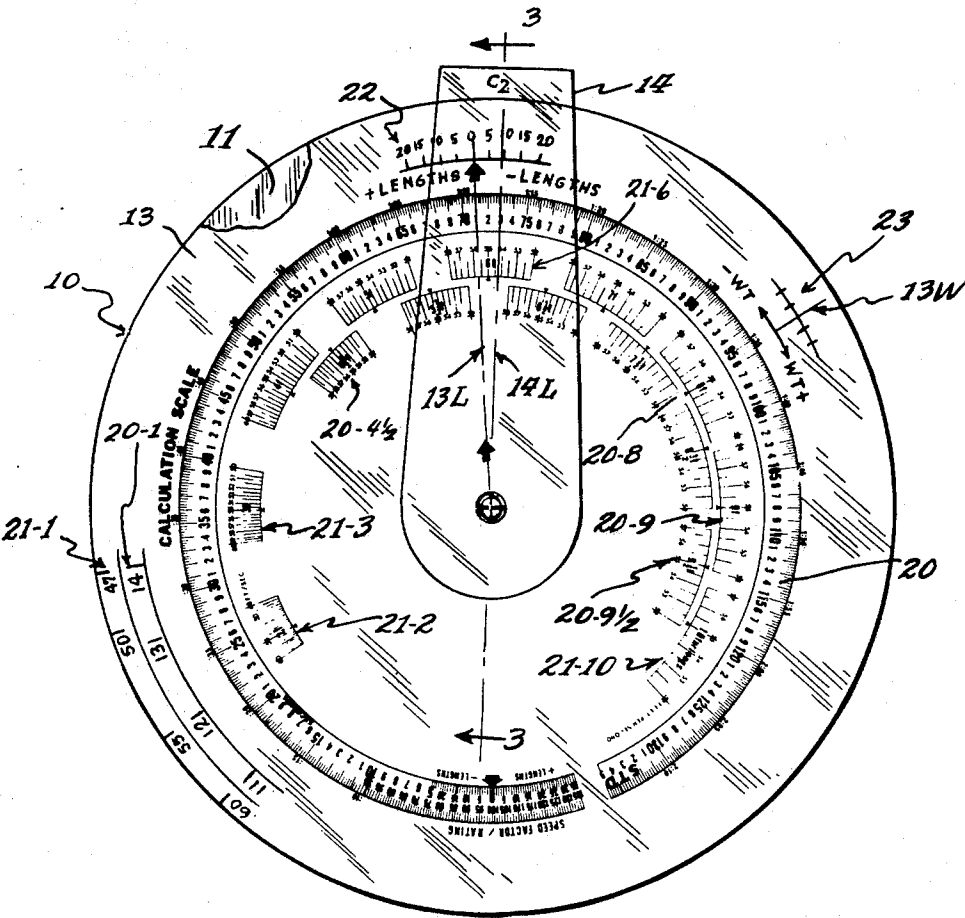
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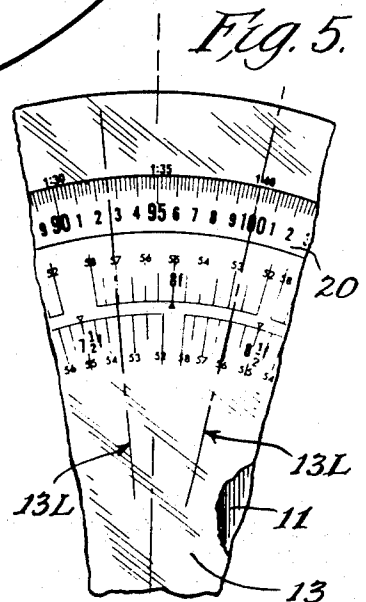
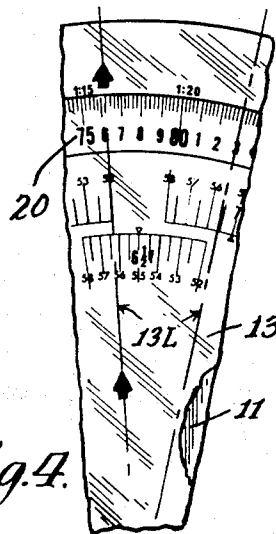
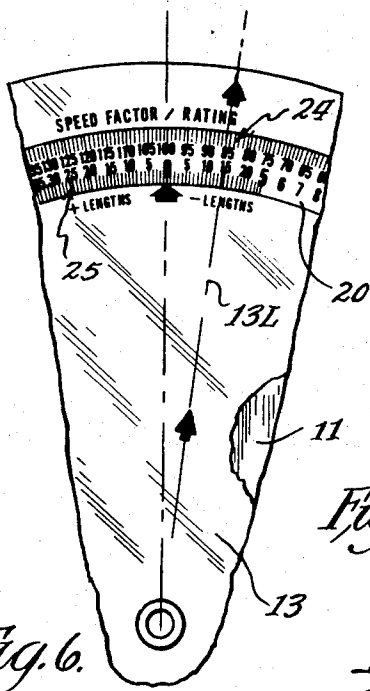
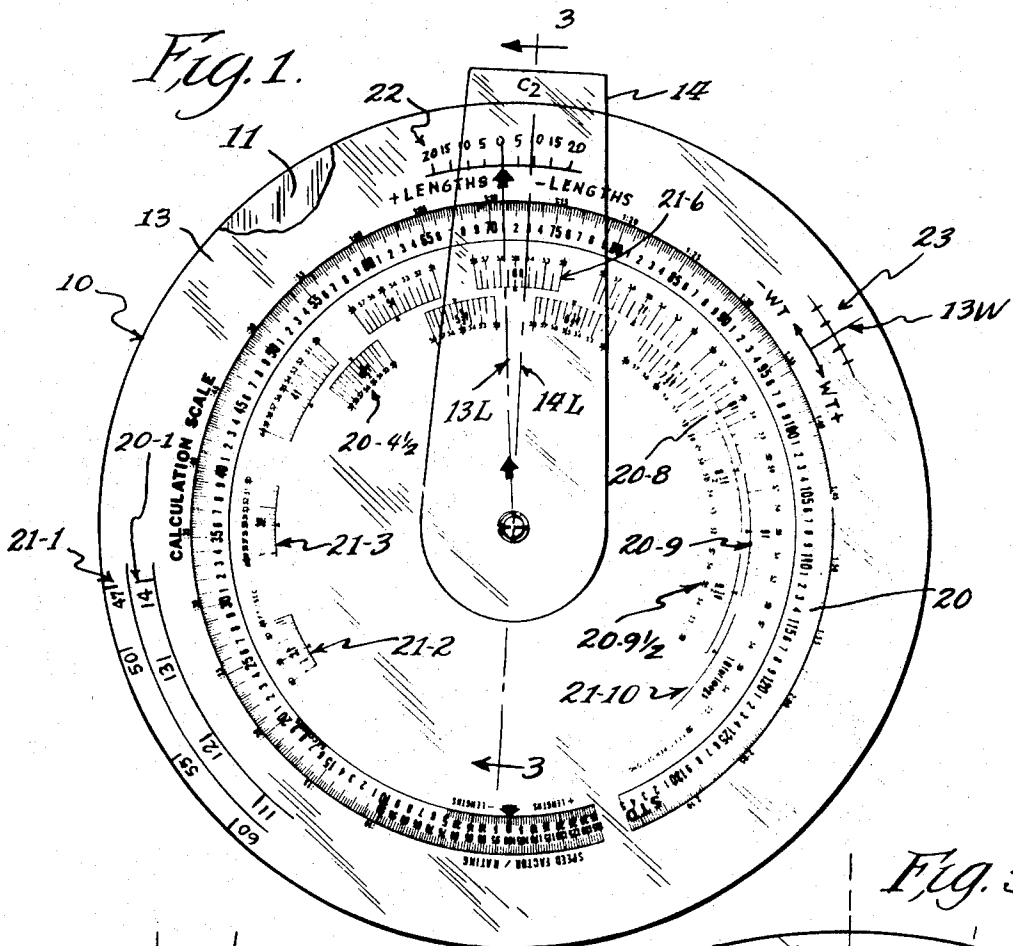
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[57] ABSTRACT

A speed register intended for thoroughbred racing (flat) is disclosed in a circular slide embodiment and in a straight slide embodiment. The circular slide has a base provided with an annular elapsed time scale and a set of corresponding speed readout scales spaced therealong according to individual race distances. The circular slide embodiment includes a set of rotary discs and cursors secured by a pair of eyelets to accommodate relative shifting movement. The straight slide embodiment includes a plurality of base scales each associated with common cursor elements, with the base scales being relatively shiftable to portray relative performance factors simultaneously with direct speed readouts. A pivoted base scale also enables conversion of past performance data between tracks having different speed characteristics.

6 Claims, 6 Drawing Figures

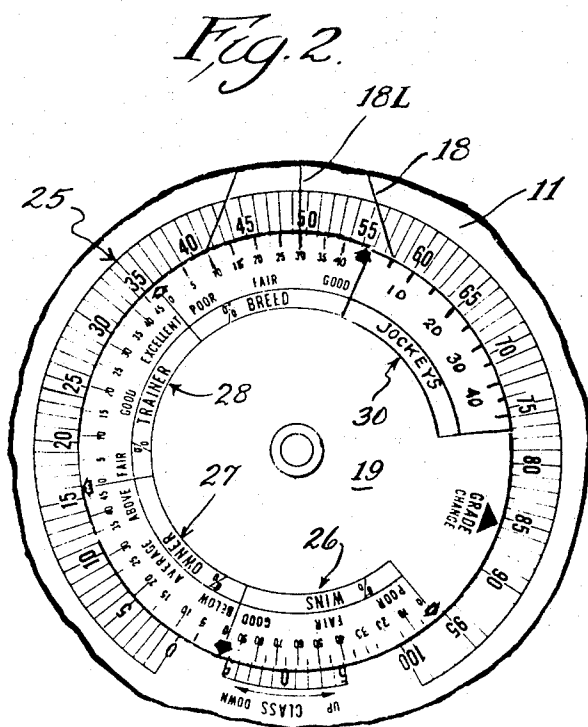
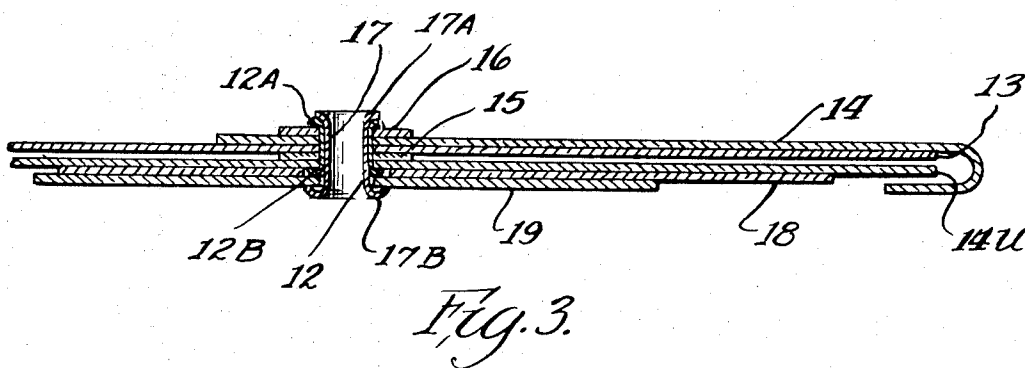




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SPEED REGISTER

This application filed as a division of pending U.S. application Ser. No. 653,061 filed July 13, 1967, entitled "Speed Register," now U.S. Pat. No. 3,473,731.

BACKGROUND OF THE INVENTION

This invention relates to a speed register for providing direct comparisons of past performance data for race contests run over a variety of known distances. The invention enables a truly empirical approach to the analysis and correlation of the past performance data.

In most race contests, such as thoroughbred racing (flat), standard bred (harness), quarter horse racing, greyhound racing, track and field racing and motorboat and automobile racing, the events are conducted at a variety of different but known distances and the results are reported by distance and time with no specific report on speed in terms of distance. In many instances, only the running time for the winner is given and the runnerups are reported in relation to the number of lengths behind the winner at the finish line. This information enables reasonably accurate estimates of the running times for each contestant. There is given, in addition, in most instances, the running time for the leader at predetermined intermediate "points of call" or fractions of course distance and the number of lengths behind at each such point of call is given for each of the other contestants.

There is also given in the statistical reports much additional data depending on the type of contest, such as track condition, wind effects, weight carried and the like. It must also be remembered that the racing contests are conducted over a variety of distances, so that comparison of running times becomes impractical and requires a departure from absolute and empirical standards.

In short, the statistical data which is available is vast and appears very complex to even the experienced analyst. While speed is the ultimate factor in any racing contest, scant, if any, specific data is given for speed and much confusion results in the evaluation of the past performance data where distances are not identical. In sports such as horse racing and greyhound racing, the true speed capabilities are important not only for use in selecting speedy performers for future events but for selecting the proper competitive level and for making evaluations of breeding lines both to improve the breed and to aid in selecting yearlings based on breed lines.

DESCRIPTION OF THE PRIOR ART

Many shorthand approaches and devices for combining various factors in the performance data are available where arbitrary values are assigned and correlated to arrive at some artificial factor for each contestant. Comparison of these artificial factors is then to be used as the basis of selection. Approaches of this type appear in U.S. Pat. Nos. 2,185,202, 3,038,655 and 3,045,906. These devices are not empirical and do not give absolute figures having any clearly defined meaning. They do not leave room for value judgments or analysis and, therefore, do not enlighten or enhance the skill of the user.

SUMMARY OF THE INVENTION

In accordance with the present invention, a multidistance racing speed register is provided to assimilate the diverse past performance data and give a direct readout of absolute speed in terms of distance per unit of time. Average absolute speed for the entire distance and average absolute speed values at fractional distances can be registered. Changes in absolute speed during a particular race also show up the ability of a particular entry to accelerate. Not only does absolute speed enable comparisons between performances at different distances but it provides a frame of reference against which the effect of other variables such as track condition, weight and the like may be judged in relation to each performer.

The multidistance racing speed register comprises a pair of relatively movable members, one having an elapsed time scale

extending therealong and having a plurality of individual speed readout scales spaced therealong according to individual race distances, the speed scales each including a common range of speed values representative of typical speeds attained at the various distances, each speed scale being positioned along a portion of the elapsed time scale for which the speed values correlate with the time values in relation to the particular distance which such speed scale represents, the other member having a pointer to align with a time value and a speed value for the same distance.

Other features and advantages of the invention will be apparent from the following description and claims, and are illustrated in the accompanying drawings which show structure embodying features of the present invention and the principles thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings forming a part of the specification, and in which like numerals are employed to designate like parts throughout the same,

FIG. 1 is a top plan view of the speed register of this invention;

FIG. 2 is a fragmentary bottom plan view of the same;

FIG. 3 is a fragmentary transverse section taken on the line 3-3 of FIG. 1;

FIG. 4 is a diagrammatic fragmentary top plan view illustrating certain settings of the register; and

FIGS. 5 and 6 are diagrammatic fragmentary top plan views illustrating other settings of the register.

DESCRIPTION OF PREFERRED EMBODIMENT

Referring now to the drawings and particularly to FIGS. 1, 2 and 3, the illustrated embodiment of the invention shows a register 10 of the circular slide type and calibrated for thoroughbred turf racing. It is to be noted that the register can be embodied as a straight slide type.

For example, in thoroughbred turf racing, nearly all of the races fall into certain standard distance categories, such as 5 furlongs, $5\frac{1}{2}$, 6, $6\frac{1}{2}$, 7, $7\frac{1}{2}$, 8 (1 mile), $8\frac{1}{2}$, 9, $9\frac{1}{2}$ and 10. There are shorter distances for young 2-year-olds and longer distances for a few special events. In general, however, the average speed for a contestant capable of contention is in a range from about 48 ft./sec. to about 60 ft./sec. In longer races, such as 10 furlongs, the average speed range is from about 52 ft./sec. to about 57 ft./sec. For shorter races, or for fractions of a long race, the average speed range may exceed the 52 to 57 ft./sec. range.

In other sports, such as standard-bred sulky racing and greyhound racing, the particular race distances and the typical ranges of average speed values are different so that different speed scale calibrations are required. For purposes of illustrative disclosure, the particular values are given herein in detail for thoroughbred turf racing and only certain general value relationships are provided herein for sulky and greyhound racing. For example, for quarter horse racing, the average speed range is from about 58 to 60 ft./sec. and for greyhound racing, the average speed range is from about 49 to about 55 ft./sec.

In the circular slide type of thoroughbred speed register shown in FIGS. 1, 2, and 3, the device includes a base member 11 which is provided with a central stub eyelet 12 that receives an indicator dial 13 and a cursor 14. A plastic washer 15 of about 0.010 inch thickness encircles the eyelet 12 and is sandwiched between the base 11 and the indicator dial 13 to maintain free relative rotation therebetween and opposite ends of the eyelet are rolled outwardly to provide upper and lower retaining flanges 12A and 12B, respectively. A nylon washer 16 is disposed between the upper flange 12A and the cursor arm 14 to allow relatively free rotation thereof, while the lower flange 12B engages directly against the base 11 which, being of largest diameter, is normally to be held stationary in the hands of the user while the remaining elements are manipulated to various rotary positions.

The subassembly defined by the stub eyelet 12 is telescoped over a central eyelet 17 that also receives a cursor 18 and a rating disc 19. Opposite end of the central eyelet 17 are rolled outwardly to provide upper and lower retaining flanges 17A and 17B, respectively. The cursor 18 has its inner periphery abutting the lower flange 12B of the stub eyelet which acts as an inner bearing therefor.

The eyelet 12 serves as a pivot shaft for guiding relative rotary movement between the base 11, the indicator dial 13 and the cursor 14. In addition, the cursor 14 is rideable with the indicator dial 13 to enable transfer of differential readings therebetween from one region to another. The cursor 14 has a U-shaped free end 14U bending around the periphery of the base 11 to facilitate finger manipulation of the cursor. The eyelet 17 serves as a pivot shaft for guiding relative rotary movement between the base 11, the cursor 18 and the rating disc 19.

The register incorporates two unique but complementary approaches to the analysis and use of past performance data. The top face of the base is pictured in FIG. 1 which also shows the transparent indicator dial 13 and the cursor 14 which are to be used in conjunction with the top face for making speed readings and adjustments. The bottom face of the base is pictured in FIG. 2 which also shows the cursor 18 and the rating disc 19 which are used in conjunction with the bottom face for weighting and totalizing various factors or criteria that have proven to be useful in evaluations of thoroughbred racing abilities.

Turning first to the speed register arrangement shown in FIG. 1, the top face of the base member 11 is provided with an elapsed time scale 20 arrayed annularly about the pivot shaft and arranged in uniformly spaced divisions of seconds numbered from 0 to 135, also the minute-second equivalents from 0 to 2 minutes, 15 seconds are labeled on the elapsed time scale, with subdivisions of fifths of a second in accordance with the present practice of reporting time data in fifths of a second. In the disclosed embodiment, the elapsed time scale is linear. At present, the time data reported for quarter horse racing and greyhound racing is given to one-tenth of a second.

For each particular race distance of interest, the base member 11 is provided with a corresponding individual speed scale, the speed scale for 2 furlongs being designated 21-2, for 3 furlongs being designated 21-3 and so on up to 10 furlongs which is designated 21-10. Each speed scale is located in predetermined relation to the elapsed time scale in accordance with the typical range of running times for the particular distance. Thus, for the 6-furlong speed scale 21-6, the region of the elapsed time scale from 68 seconds to 76 seconds (that is, from 1:08 to 1:16) is spanned and the speed scale has a range from about 52 to about 58 ft./sec. It may also be noted that in the illustrated embodiment, the speed scales are not linear in that the division spacing for one distance is different from that for other distances. Thus, on the 10-furlong speed scale 21-10, the differential between speeds of 55 and 56 ft./sec. corresponds in time to the difference between 120 and 115 4/5 seconds or 4 1/5 seconds of elapsed time. Correspondingly, on the 2-furlong speed scale 21-2, the differential between speeds of 55 and 56 ft./sec. corresponds in time to the difference between 24 and 23 3/5 seconds or about two-fifths of a second of elapsed time.

The scale divisions on the speed scale become small at the shorter distances where the elapsed time scale is linear but there is the advantage that the linear arrangement of the elapsed time scale extends almost full circle so as to simulate the effect of the familiar stop watch and thus is more understandable to the user who lacks technical background.

Based on the foregoing description of the elapsed time and speed scales shown in the drawings, it should be apparent that since the elapsed time scale is linearly arrayed and since each of the particular speed scales has speed indicia in the form of integers representing speed in feet per second, the speed indicia on each of the particular speed scales correlate with the time indicia in accordance with the absolute speed formula

$S=D/T$, where S is given in units of length per unit of time (feet per second), D is given in units of length (feet) and represents the predetermined distance to which the speed scale corresponds, and T is given in units of time (seconds).

Certain specific spatial relationships exist between the speed indicia of the various speed scales which uniquely characterize the physical structure of the speed register. These relationships are apparent from the preceding description of the speed scales and elapsed time scales shown in the drawings. By way of illustration, however, it should be noted that for any particular speed scale, for example for the 6½-furlong scale shown in FIG. 4, integers 52 through 58 are successively angularly spaced in a nonlinear relation along the elapsed time scale 20. Thus, the spacing between speed value 52 and 53 is greater than the spacing between speed value 53 and 54, etc. It is more readily apparent that the spacing between 52 and 53 is greater than the spacing between 57 and 58.

A further inherent spatial relationship can be shown to exist between equal valued integers on the various speed scales; for example speed values of 57 on the 7-furlong and 8-furlong scales are spaced apart a specific angular distance, the speed values 57 on the 6-furlong and 7-furlong scales are spaced apart a specific angular distance identical to that for the spacing of the 57 values on the 7-furlong and 8-furlong scales. These relationships exist as between all of the scales in direct linear proportion to the difference between the predetermined distances as such relationships are inherent structural results of the absolute speed formula.

There is an important need for calculations of fractional race distances such as 1 or 2 furlongs. Past performance data frequently includes enough information to permit the calculation of speed during the beginning, the middle or the stretch but little, if any, practical use has previously been made of such information. In the illustrated embodiment, an expanded elapsed time scale and matching speed scale for a 1-furlong distance are shown at 20-1 and 21-1, respectively, to facilitate accurate readings of speed for fractional race distances. In any event, it may be seen that there exists a common range of speed values 52 to 57 ft./sec. which is included in each speed scale 21-1 to 21-10. The invention is particularly useful because the thoroughbreds maintain a consistency in speed over a range of distances. A single simple device may thus cover the entire spectrum of racing abilities.

One of the primary uses for 82 computer 10 is to convert running times over different distances to speed in terms of feet per second. Thus, a particular horse may have a previous race run in 76 1/5 seconds at 6½ furlongs, another in 83 seconds at 7 furlongs and others in a running time of 92 3/5 seconds at 8 furlongs and in 100 seconds at 8½ furlongs whereas the next race is to be run at 7½ furlongs. As indicated in FIG. 4, the indicator line or pointer 13L on the indicator dial 13 is set to a running time of 76 1/5 second to show an average speed of 56.4 ft./sec. for 6½ furlongs, then the pointer 13L (as shown in phantom) is set to a running time of 83 seconds to show an average speed of 55.6 ft./sec. for 7 furlongs. As indicated in FIG. 5, the pointer 13L is set to a running time of 92 3/5 seconds to show an average speed of 57 ft./sec. for 8 furlongs and (as shown in phantom) is set to a running time of 100 seconds to show an average speed of 56 ft./sec. for 8½ furlongs.

In this example, one fact which stands out is that the horse should also be capable of running the 7½-furlong race at 57 ft./sec. which was attained at the 8-furlong distance. Many additional analyses can also be made with reference to the calculated speeds. For example, if the horse carried more weight in the 6½ and 8-furlong events than in the 7- and 8½-furlong events for which slower average speeds are shown, it is reasonable to conclude that the horse is not weight sensitive. Moreover, if the horse has shown greater average speed on the grass than in flat racing, it can be concluded that grass races do not affect his speed. In any event, the purpose of the invention is not to decide how to handicap but rather to provide a

tool for providing important empirical data based on the actual past performance data and giving an absolute standard for aiding in comparing the effect of the numerous other factors which are reported.

Of equal importance is the potential use of the register to owners, trainers and breeders. The direct registry of speed gives added insight to a horse's ability and leads to refinements in judging the condition and class of a particular horse and the overall value of the horses belonging to a particular breed line. Extension of the speed analysis to fractional times provides an indication of acceleration and this offers an entirely new measure of performance which has never been approached empirically.

The transparent indicator disc 13 has a lengths scale 22 centered on the pointer line 13L and marked off in lengths + and -, each numbered 0 to 20. The lengths scale 22 is arranged at a location immediately radially outwardly of the elapsed time scale so that the parts may be arranged as shown in FIG. 1 for ease in registering speed readings from past performance data which gives the running time for the winner and the lengths behind for the trailing horses.

For example, in FIG. 1, the line 13L is registered at 71 on the elapsed time scale indicating a running time for the winner of 1 minute and 11 seconds for a 6-furlong race, giving the winner a speed of 55.6 ft./sec. If a trailing horse finished 9 lengths behind, the base 11 and indicator disc 13 are held fixed and the cursor 14 has its hairline 14L set at 9 on the (-) LENGTHS scale to show a running time of 73 seconds and a speed of 54.2 ft./sec. for the trailing horse. The lengths scale is made up on the basis of counting one-fifth of a second for each length. Similar readings may be made for each of the other trailing horses so that the past performance data may be set directly into the speed register of this invention for obtaining a direct readout in speed in terms of feet per second.

The indicator disc 13 also has a weight scale 23 arranged at a location immediately radially outwardly of the elapsed time scale 20 so that setting adjustments either of elapsed time or of speed may be made in accordance with weight changes. For this purpose, the indicator disc 13 is positioned so that the weight hairline 13W which is centered on the zero or no weight change point of the weight scale 23 is first aligned with the cursor hairline 14L which has previously been set for the particular past performance that is being analyzed. The indicator disc 13 is then held stationary while the cursor hairline is rotated clockwise along the weight scale to allow for a weight increase or counterclockwise to allow for a weight decrease.

While the invention emphasizes the value of developing direct empirical data on speed, provision is also made for developing a direct readout of speed factor. Thus, a correlation of speed factor and lengths scales 24 and 25, respectively, is provided at the beginning of the elapsed time scale which appears at the bottom of FIG. 1 and which is shown enlarged in FIG. 6. It is desired at times to establish a nominal reference value for speed rating numbers at 100. This 100 value may correspond to the world record or the track record for a particular distance or it may correspond to the speed of the winning horse in some particular race under analysis. Assuming the latter, the indicator disc 13 is set so that its hairline registers the lengths behind for the trailing horse, here represented as 15 lengths behind. The hairline 13L then gives a speed factor rating of 85 for the trailing horse.

On the lower face of the base member 11, an annular totalizer scale 25 is provided at a location encircling the periphery of the rating disc 19. The rating disc 19 has a set of successive rating scales 26 to 30 arrayed as annular segments thereon and each representative of a different factor that has proven useful in the evaluation of thoroughbred racing abilities. In the disclosed embodiment, the totalizer scale 25 is linear and the rating scales 26 to 30 are logarithmic. Rating scale 26 is laid out in percent from 0 to 100 based on the ratio of wins; rating scale 27 is laid out in percent from 0 to 50 based on the record of the owner; rating scale 28 is laid out in percent from 0 to 50

based on the record of the trainer; rating scale 29 is laid out in percent from 0 to 50 based on the record of the breed; and rating scale 30 is laid out in percent from 0 to 50 based on the record of the jockey. Numerous publications provide statistical data on these various factors and the disclosed register arrangement provides a unique logarithmic totalizing of these factors.

To carry out a totalizing operation, the zero marks on scales 25 and 26 are registered and the hairline 18L of the cursor 18 is set at the appropriate rating value (for example 40 percent) on the WINS scale 26. The cursor 18 is then held fixed relative to the scale 25 and the rating disc 18 is moved until the zero mark on scale 27 is registered with the hairline 18L. The rating disc 18 is then held stationary relative to the scale 25 and the cursor 18 is moved to set the hairline at the appropriate mark on the OWNER scale 27. This sequence is repeated for each of the remaining scales until a total is derived at the reading of the hairline 18L on the totalizing scale.

While preferred constructional features of the invention are embodied in the structure illustrated herein, it is to be understood that changes and variations may be made by those skilled in the art without departing from the spirit and scope of the appended claims.

The embodiments of the invention in which an exclusive privilege or property is claimed are defined as follows:

1. A multidistance racing speed register comprising a circular baseplate provided with time indicia defining a linear elapsed time scale in fixed relation along said baseplate and provided with speed indicia defining a plurality of speed scales, each representative of an individual predetermined distance, disposed at predetermined fixed locations along said baseplate, each speed scale spanning a common predetermined speed value range and each extending alongside a portion of the elapsed time scale for which the speed indicia of the particular speed scale correlate with the time indicia in accordance with the absolute speed formula

$$S=D/T$$

where

S is given in units of length per unit of time,
D is given in units of length and represents the predetermined distance to which the speed scale corresponds, and
T is given in units of time;

said speed indicia for each speed scale including integers successively angularly spaced nonlinearly along each individual speed scale, with the equal valued integers on said speed scales being spaced apart in direct linear proportion to the difference between the predetermined distances represented by said speed scales; a second member having pointer means; and guide means shiftably connecting said members for relative movement for positioning said pointer means relative to said scales such that the pointer means, when aligned with any value on the elapsed time scale, indicates the speed corresponding to such value on the corresponding speed scale.

2. A register in accordance with claim 1 wherein said guide means comprises a pivot element centrally in said base member and mounting said second member for rotation thereabout, said elapsed time scale and said speed scales being arrayed annularly about said pivot element as a center.

3. A register in accordance with claim 1 wherein said guide means comprises a pivot element and wherein said base member is a base disc having a central opening receiving said pivot element and having said elapsed time and speed scales arrayed annularly about said opening as a center, said second member is a transparent disc having a central opening registering with said first opening, receiving said pivot element and having a radial hairline to overlie said elapsed time and speed scales, said transparent disc having lengths indicia providing an annular scale calibrated relative to the elapsed time scale, registered with said hairline and arrayed annularly about said pivot element, and a cursor rotatable on said pivot element and overlying said transparent disc and having a radial hairline to intersect all of said scales to provide direct speed readout from lengths differential data.

4. A register in accordance with claim 3 wherein said cursor has a U-shaped finger grip end trained radially around the outer periphery of said base disc, said cursor having a flush overlying relation to said transparent disc to rotate in unison therewith, said grip end being engageable to rotate the cursor relative to the transparent disc.

5. A register in accordance with claim 3 wherein an eyelet constitutes said pivot element and rotatably connects a subassembly of said base disc, said transparent disc and said cursor, said eyelet including end flanges retaining said subassembly, said subassembly including a first washer encircling said eyelet and disposed intermediate said discs and a second washer disposed between said cursor and one end flange of said eyelet.

6. A register in accordance with claim 5 wherein a second

eyelet extends through and beyond the first-named eyelet, a third disc disposed adjacent said base disc and encircling the other end flange of the first-named eyelet, and a second cursor rotatable on said second eyelet between said base disc and said third disc, said second eyelet having end flanges engageable at one end with said first-named eyelet and at the other end with said second cursor, said base disc having a totalizing scale extending circularly about said opening on the side thereof facing said third disc, said third disc having a set of successive racing factor scales extending circularly thereon for register individually with the totalizing scale, and said cursor having a hairline for transposing readings in additive relation from each of said racing factor scales to said totalizing scale.

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