July 10, 1951 W. RATH 2,559,796

AUTOMATIC TIMING DEVICE

Filed Oct. 21, 1949 5 Sheets-Sheet 1

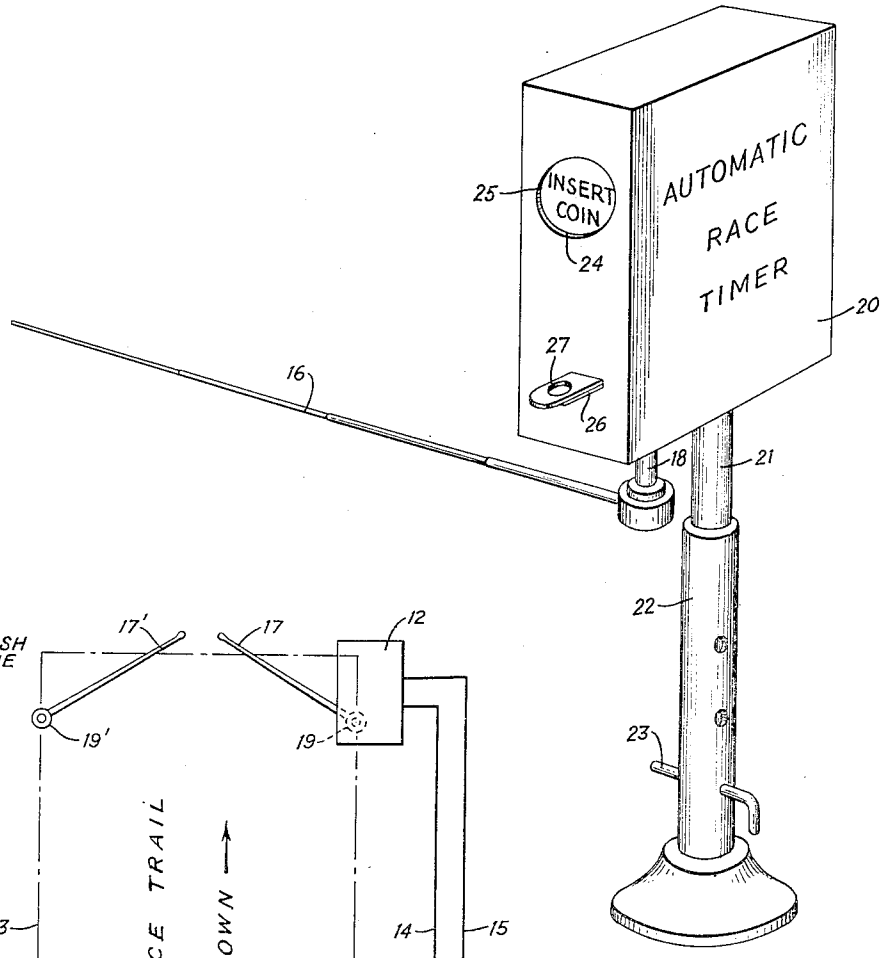


Fig. 2

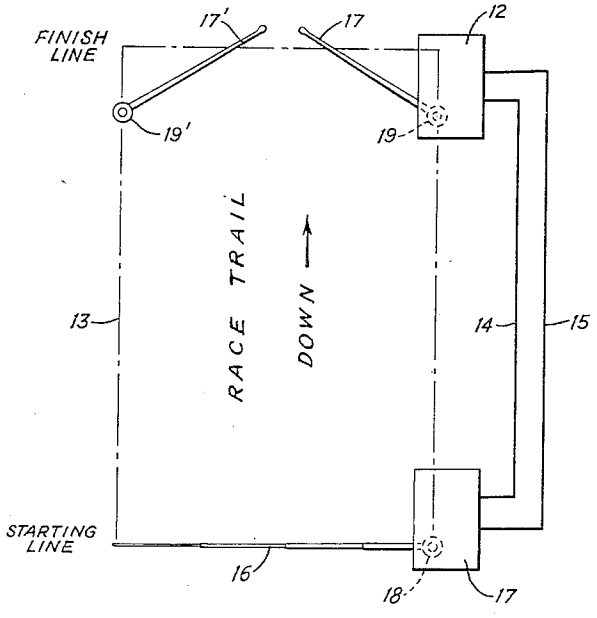


Fig. 1

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AUTOMATIC TIMING DEVICE

Filed Oct. 21, 1949 5 Sheets-Sheet 2

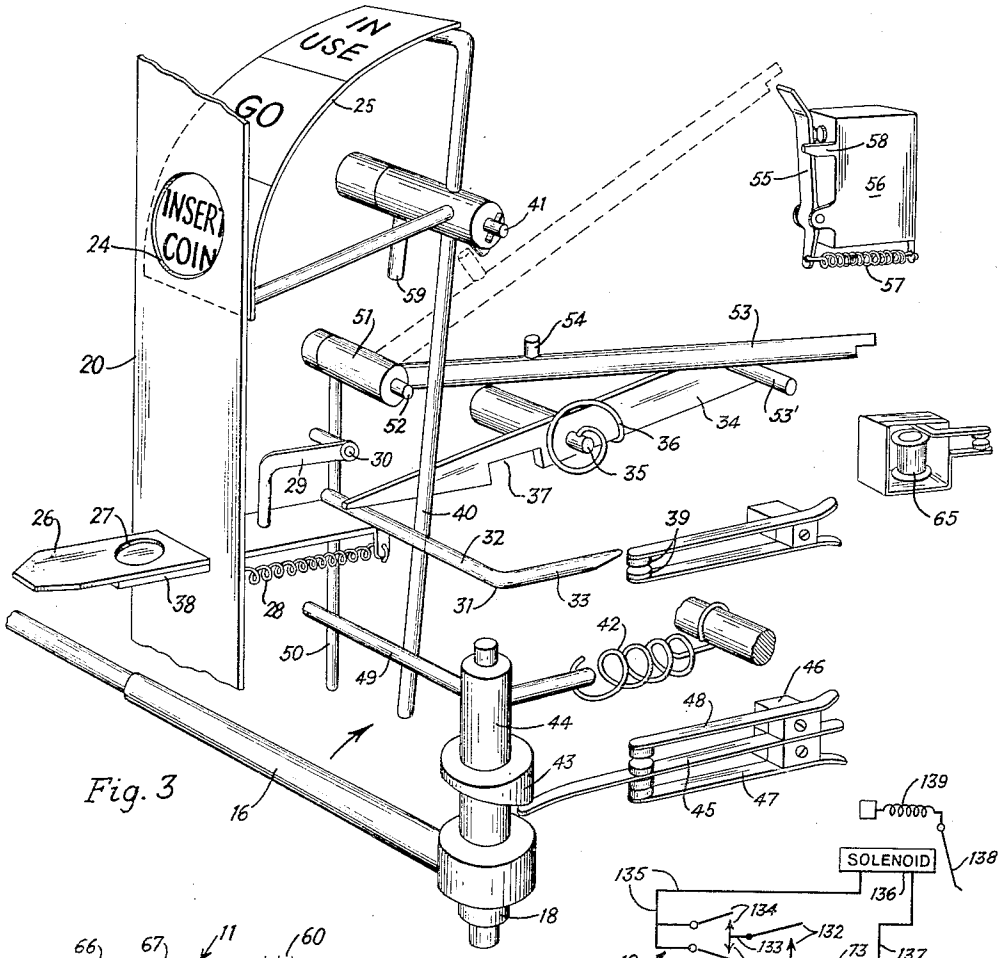


Fig. 3

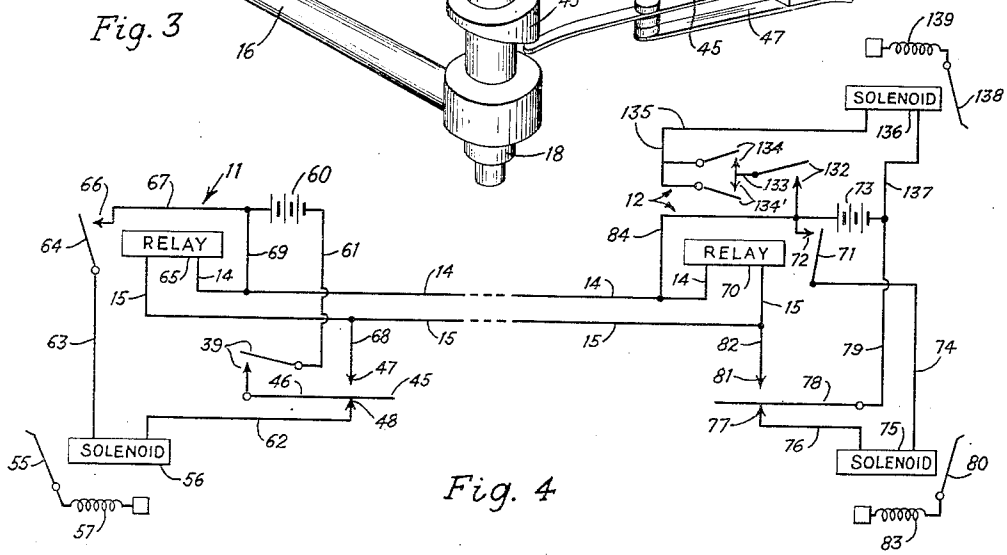


Fig. 4

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AUTOMATIC TIMING DEVICE

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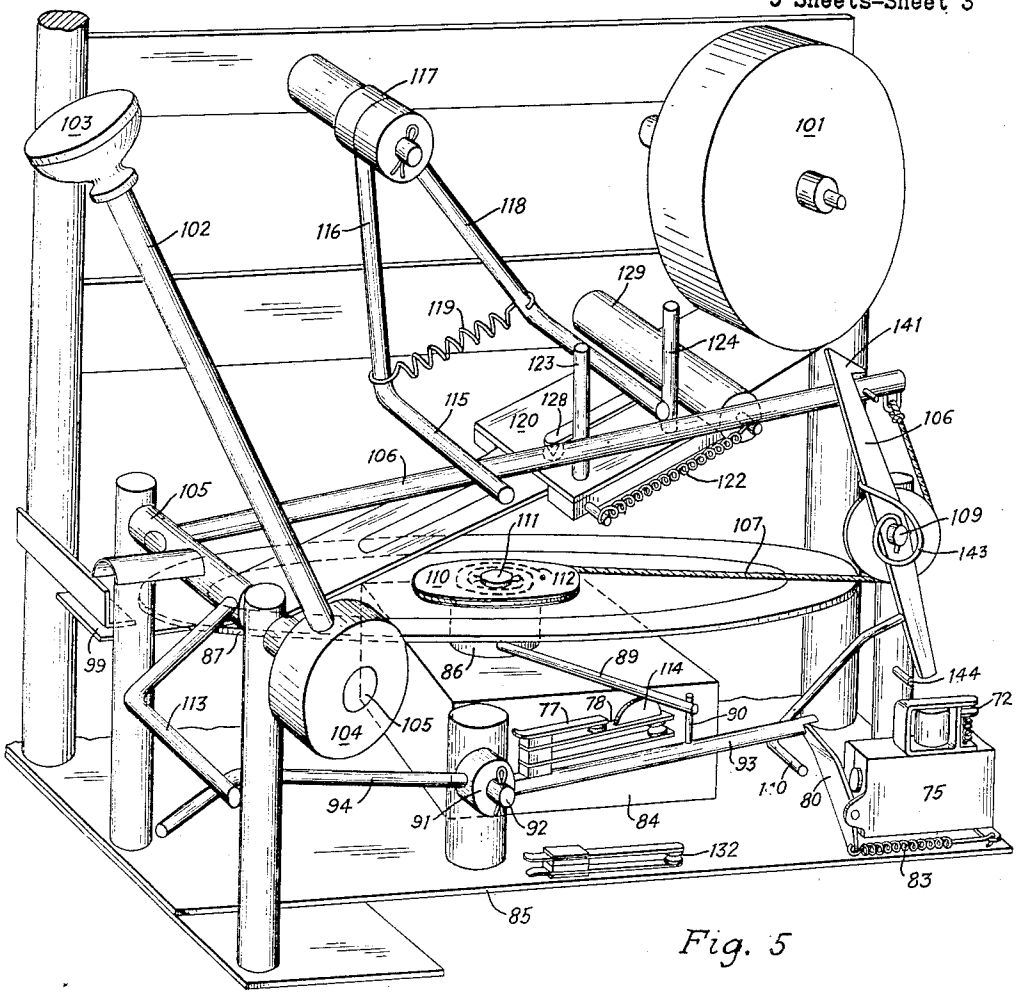


Fig. 5

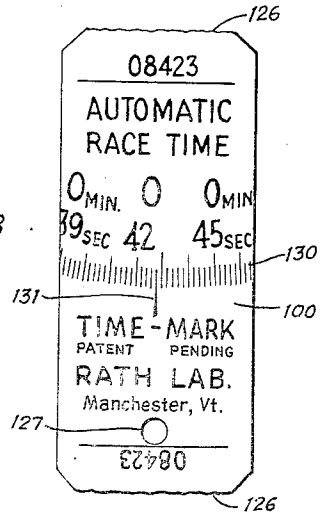


Fig. 8

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AUTOMATIC TIMING DEVICE

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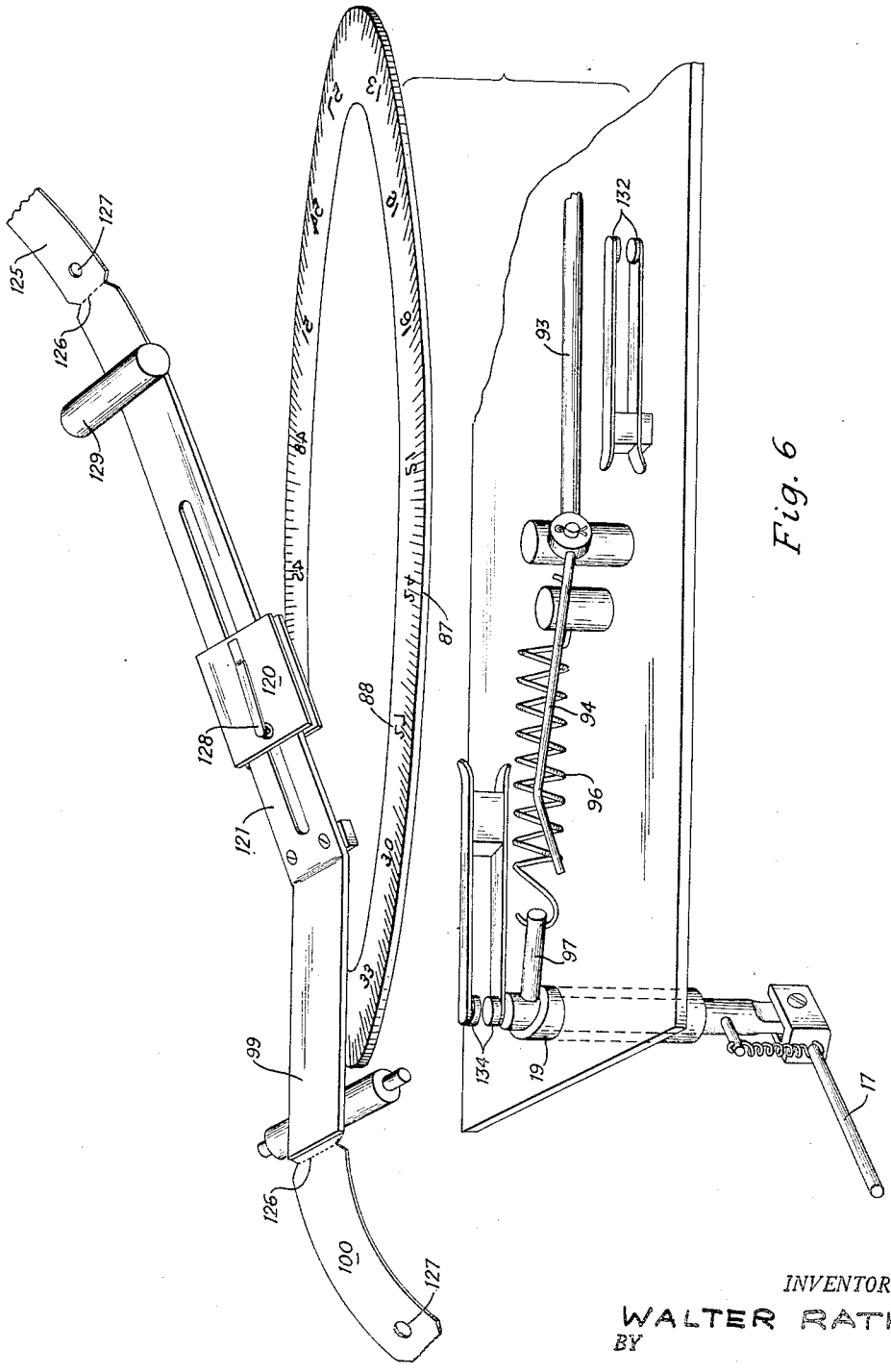


Fig. 6

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AUTOMATIC TIMING DEVICE

Filed Oct. 21, 1949 5 Sheets-Sheet 5

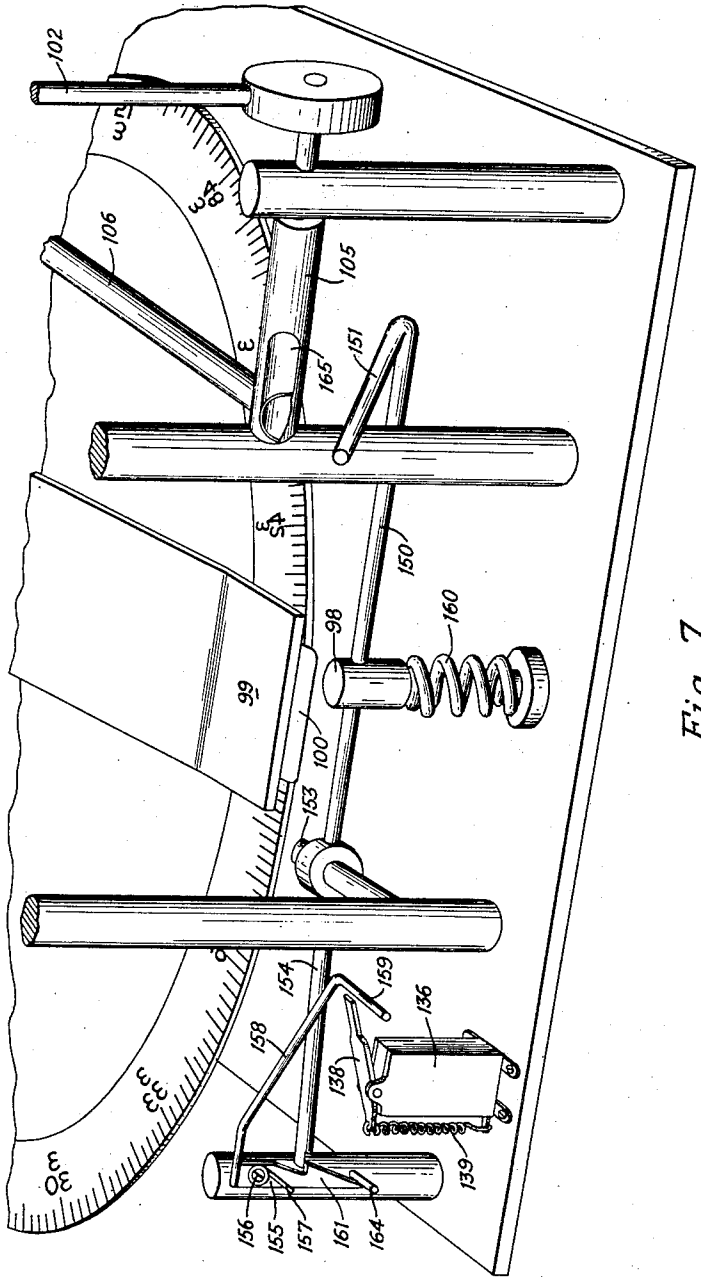


Fig. 7

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2,559,796

UNITED STATES PATENT OFFICE

2,559,796

AUTOMATIC TIMING DEVICE

Walter Rath, Dorset, Vt.

Application October 21, 1949, Serial No. 122,675

10 Claims. (Cl. 161—18)

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This invention relates to automatic timing devices for determining the time required by a person or object to move from a starting point or line over a given course to a finish point or line. The invention provides an improved timing apparatus which is particularly suited for the self timing of runners, skiers and swimmers and provides in its preferred form an apparatus which automatically measures the time elapsed between the passage by a person of a starting line and his passage of a finish line. The apparatus may be equipped to furnish a printed time record to the person using it.

The timing device basically comprises two stations connected through an electric circuit. A starting station is equipped with a passage responsive means which may assume a wide variety of forms. It may be a contact cable, a swing bar moved by the racer, a photo-electric device whose light beam is broken by the racer, or any other kind of device adapted to actuate, usually through electric means, a timing means which for reasons of convenience, will hereinafter be referred to as a "clock," it being understood that the timing means may also assume a variety of forms. It may be a spring-motor operated clock of conventional construction, an electric clock which in essence is a constant speed motor or may be any other form of known device for determining lapse of time.

The finish line station is also provided with a passage responsive means which operates to stop the clock so that it can be read, or causes a time mark to be made on a record from which the elapsed time is then ascertained.

Conventional timing devices usually require at least one operator for attending to the numerous details, such as starting the racer, resetting of the timer clock, removing of the time record, if one is made, or other details which ordinarily should not be attended to by the racer.

The present invention provides a timing apparatus which is particularly designed for use by the racer himself, all operations being automatic or capable of being performed by an average untrained person using the device.

The present invention is illustrated by application to a timing device specifically designed for skiing races, it being understood that, with only minor modifications of its passage responsive means, it can be used in other kinds of races, such as track races, boat races, swimming races and various others. The device is preferably coin operated and comprises two stations connected by an electric circuit. A passage responsive means at the starting line station starts a clock which is preferably of the recording type and a similar passage responsive means at the finish line station stops the clock or causes a mark to be affixed to the time record.

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The device is so constructed as to prevent use by a second person while the first person is still on the course. For this purpose blocking means are provided at the starting line station which are automatically rendered effective by passage by the racer of the starting line station. The blocking remains in effect until the racer passes the finish line. Preferably the unblocking operation is coupled with the issuance to the racer of a printed time record of his race, whereafter the device is available for reuse.

In order to advise perspective users of the device of its present availability or non-availability indicating or signaling means are provided at the starting line station. Such signals may simply indicate conditions of availability or non-availability, but in the case of a coin operated device may indicate three distinct conditions. There is firstly the condition of availability of use, which means that a perspective user may insert a coin into the device. Insertion of the coin automatically puts the apparatus into a condition of readiness which may be indicated by a second signal. When the racer passes the starting line the signal is automatically changed to indicate non-availability to subsequent users. Preferably the coin device is so constructed that no further coin is accepted while the device is in use.

When the racer receives his time record after passage of the finish line, or otherwise receives an indication of elapsed time, the device is unblocked, and the signal at the starting station changes automatically to indicate availability for use, whereafter the next user may insert his coin and repeat the same series of operations.

These and various other features and advantages of the invention will appear more fully from the detailed description which follows accompanied by drawings showing, for the purpose of illustration, an application of the principles of the invention to a timing device for skiing races. The invention also consists in certain new and original features of construction and combination of elements having a wider field of use. Such features will hereinafter be set forth and claimed.

Although the characteristic features of the invention which are believed to be novel will be particularly pointed out in the claims appended hereto, the invention itself, its objects and advantages, and the manner in which it may be carried out may be better understood by referring to the following description in connection with the accompanying drawings forming a part of it in which:

Figure 1 is a diagrammatic illustration of the timing device;

Figure 2 is a perspective view of the starting line station;

Figure 3 is a perspective view of mechanism of the starting line station;

Figure 4 is a diagram showing the electric circuit;

Figure 5 is a perspective view of certain mechanism at the finish line station;

Figure 6 is a perspective view of certain mechanism for printing the time record;

Figure 7 is a perspective view of further mechanism for printing the time record; and

Figure 8 shows a time ticket as issued by the finish line station.

In the following description and in the claims the various details will be identified by specific names for convenience. The names, however, are intended to be as generic in their application as the art will permit. Corresponding reference characters refer to corresponding parts in the several figures of the drawings.

In the drawings accompanying, and forming part of this specification, certain specific disclosure of the invention is made for the purpose of explanation of broader aspects of the invention, but it is understood that the details may be modified in various respects without departure from the broad principles of the invention and that the invention may be applied to other structures than the ones shown.

As illustrated in Figure 1 the timing device comprises a starting line station 11 and a finish line station 12 are spaced along a race trail 13. The stations are connected by electric lines 14 and 15 for communication with each other. Each of the two stations are provided with a passage responsive means, which in the illustrated form of apparatus is a light weight bar or rod 16. The rod 16 is pivotally mounted at 18 and extends across the race trail. At the finish line where the racer travels at a considerable rate of speed, it is preferred to provide two light weight rods 17 and 17' of the fishing rod type mounted at 19 and 19', so that they point at an angle of 45 degrees into and down the trail, their ends about 10 inches apart. When the racer crosses the finish line either one or both of these rods are deflected to operate the finish line station.

Each of the stations consists essentially of a housing mounted on a pedestal. This arrangement is illustrated in Figure 2 showing the housing 20 of the starting line station mounted upon a post 21 vertically adjustable on a heavy pedestal 22 by a pin 23 for adjustment of the height of the swing rod 16 according to the prevailing depth of the snow. The housing 20 is provided with a window 24 through which a signal 25 is visible. A coin slide 26 projects from the housing when the device is not in use. The slide may be depressed into a position in which its coin receiving aperture 27 is covered to prevent further insertion of coins during the period of non-availability of the timing device, that is during the period of use by a racer who is on the trail and has not yet received his time record.

The construction and operation of the mechanism of the timing device will become apparent from the perspective illustrations, Figures 3, 5 and 6 taken together with the wiring diagram of Figure 4.

Referring first to Figure 3 the coin slide 26 is biased by a spring 28 towards its projecting position in which a coin may be inserted into the receiving aperture 27. A feeler lever 29 pivoted at 30 rests against the top surface of the slide and engages the aperture 27 in the event no coin has been inserted, thus preventing a slide 26 from reaching a position in which the timing mechanism becomes operative.

If a coin has been inserted, the slide 26 may be depressed to its full extent by the user, and the feeler lever 29 passes over the coin without arresting the slide. The slide 26 is finally locked in its fully depressed position. For this purpose the slide is equipped with an angular arm 31 having a transverse portion 32 and a longitudinal portion 33. The transverse portion 32 is engaged by a rocking arm 34 pivoted at 35 and is biased in a counter-clockwise sense by a spring 36. The rocking arm 34 has a notch 37 in its lower edge. The transverse portion 32 of the arm 31 enters this notch when the slide 26 is fully depressed and the rocking arm, under action of its spring, 36 catches and detains the slide 26.

Substantially simultaneously the coin aperture 27 moves beyond the inner edge of a coin supporting ledge 38 causing the coin to drop inside the housing 20 into a suitable receptacle (not shown). The longitudinal portion 33 of the arm 31 engages and closes a pair of make contacts 39. Closing of the contacts 39 places the device into a condition of readiness, as will become apparent hereinafter.

The transverse portion 32 of the arm 31 further engages a depending arm 40 of the signal assembly 25 pivoted at 41. Movement of the coin slide 26 into its depressed position causes the signal assembly to turn until the readiness or "Go" signal appears at the window 24.

The racer now starts on the trail and at the moment of passing of the starting line strikes the swing bar 16. The swing bar is normally held in a position at right angles with respect to the trail by a biasing spring 42. Deflection of the swing bar 16 about its pivot results in actuation of mechanical as well as electrical components of the device as follows:

A cam member 43 is fixedly mounted on the pivot shaft 44 of the swing bar and actuates a movable center contact 45 of a make-break contact assembly 46. The contact assembly 46 includes a make contact arm 47 and a break contact arm 48. Downward deflection of the center contact 45 causes the contacts 45, 48 to be broken and the contacts 45, 47 to be closed. Closing of the contacts 45, 47 starts a clock at the finish line station as will be described in greater detail further below.

The deflection of the swing bar 16 by the racer causes a change in the signal at the starting station. For this purpose the pivot shaft 44 is provided with an arm 49 which strikes the depending arm 40 of the signal assembly 25 and causes it to be moved into a position slightly beyond the "In use" position indicating non-availability of the device. The arm 49 further engages a depending arm 50 of a bell crank assembly 51 pivoted at 52. The bell crank assembly is biased towards its rest position by reason of its own weight tending to turn the assembly in a clock-wise sense. The bell crank assembly includes a further hammer arm 53 carrying a detaining pin 54. In its deflected position indicated in broken lines in Figure 3 the hammer arm moves beyond the end of an armature 55 of a solenoid 56, the solenoid armature being biased in a counter-clockwise sense by a spring 57. A stop 58 limits the movement of the armature 55 under action of the spring 57.

As the hammer arm 53 moves past the armature 55, the armature is deflected temporarily

but immediately returns to its rest position thus arresting the hammer arm of the bell crank assembly 57 in its raised position. In this position the detaining pin 54 moves into the path of a corresponding projection 59 on the signal assembly arresting the signal assembly in the "In use" position indicating non-availability of the timing device.

Referring now to Figure 4 it will be seen that the closing of the contact 39 by depression of the coin slide prepares a circuit from a battery 60 through leads 61, make-contact 39, break contacts 45, 48, and lead 62 to the winding of a solenoid 56. A lead 63 extends from the solenoid winding to the armature 64 of a relay 65. The armature 64, however, is in dropped condition and a make-contact 64, 66 is open. A further lead 67 extends from the contact 66 back to the battery. No current flows, since the solenoid 56 is still de-energized by reason of the open relay contacts 64, 66. The relay 65, on the other hand, is still de-energized because of the open make-contacts 45, 47, the energizing circuit for the relay being as follows: From the battery 60 through lead 61, closed make-contact 39, open make-contacts 45, 47, lead 68, and line 15 to the relay winding, and thence through line 14 and a further lead 69 back to the battery.

Actuation of the make-break-contact assembly 46 causes the relay 65 to become energized by reason of closing of the make-contacts 45, 47. The relay pulls up its armature and closes contacts 64 and 66 leading to the solenoid 56. Simultaneously, however, the contacts 45 and 48 are broken so that the solenoid will not pull up its armature 55 and not release the hammer arm 53 resting thereon.

The lines 14 and 15 extend to the finish line station which includes a further relay 70 lying parallel to relay 65. The relay 70 therefore pulls up its armature 71 and closes a make-contact 71, 72. Current now flows from a battery 73 at the finish line station through relay contacts 72, 71, lead 74 to the winding of a solenoid 75 and thence through a lead 76 through break-contacts 77, 78 and a return lead 79 back to the battery. The solenoid 75 pulls up its armature 80 and, as will later be explained in greater detail, starts the clock.

As soon as the rod 16 returns to its normal position across the trail, contacts 45, 47 are broken and contacts 45, 48 are closed preparing an energizing circuit for solenoid 56 as follows: From battery 60 through lead 61 to coin slide contact 39, lead 46, contacts 45, 48, lead 62, solenoid 56, lead 63, relay contacts 64, 66, lead 67, back to battery 60. The solenoid 75 at the finish line station is de-energized by the breaking of contacts 45, 47 and of relay contacts 71, 72 and the armature 80 returns to its normal rest position under action of a biasing spring 83.

Referring now to Figure 5 illustrating certain portions of the mechanism of the finish line station, a clock work is enclosed within a housing 84 mounted on a base plate 85. The clock work is of the spring-motor type and drives a shaft 86 carrying a disc 87 having raised indicia 88 on its top surface. The disc 87 is mounted in a way to permit slight tilting of the disc periphery with respect to the shaft 86 for reasons which will hereinafter become apparent. The shaft 86 is arrested in the starting position of the clock by an arm 89. One end of the arm is secured to the shaft 86 and the other end rests against a projection 90 on a double armed lever

91 pivoted at 92. The double armed lever 91 has a heavy arm 93 and a light arm 94 giving the lever 93 an inherent bias in a clock-wise sense. The end of the heavy arm 93 is normally engaged by the armature 80 of the solenoid 75. As hereinbefore explained the solenoid 75 pulls up its armature when the racer passes the starting line, thus causing the lever 91 to drop and release the arresting arm 89 of the clock. The clock thereupon starts to run and rotates the disc 87.

The arm 93 drops upon a pair of make contacts 132 and upon a release arm 140 on a release lever 141 rotating the release lever 141 in a counter-clock-wise direction. Closing of the contacts 132 prepares an energizing circuit for the printing mechanism as follows: from the battery 73 through contact 132, lead 133, contact 134, lead 135, solenoid 136, lead 137, back to battery 73.

The release lever 141 is pivoted at 109 and is urged by a spring 143 against a stop pin 144. In the position in which the release lever rests against the stop pin 144, it engages a lock pin 142 on the arm 106 and prevents the arm 106 from moving. Rotation of the release lever 141 causes the lock pin 142 to be freed thus permitting a ticket to be issued and the apparatus to be reset, as will be described further below.

When the racer passes the finish line he strikes and deflects the rods 17, 17'. The rods are both mounted in a way suitable for actuating the printing mechanism. Various forms of mountings serve this purpose, a specific form being illustrated in the drawings.

The rod 17 is secured to a shaft 95 mounted for both pivotal and axial movement in a bushing 19. The shaft 95 is constrained by a spring 96 towards a position in which the rod 17 extends into the trail path. The spring 96 is attached to the end of a pin 97 engaging the sloping top surface of the bushing 19 causing the shaft 95 to rise with respect to the bushing when the rod 17 is deflected.

The top end of the shaft 95 engages a pair of make contacts 134, thus closing a circuit from battery 73, through contacts 132, lead 133, contacts 134, 134', lead 135, solenoid 136, lead 137, back to battery 73. The solenoid 136 is energized and pulls up its armature 138 which hits the angular extension 159 of an arm 158.

A hammer 98 is mounted on a lever 150 having an angular end 151. The lever 150 is under tension of a spring 160 and is pivoted at 153. The other end 154 of the lever 150 is detained by a catch assembly 155. This catch assembly 155 consists of a catch 161 pivoted at 156 and is biased by a spring 157 towards a pin 164. The catch assembly includes the angular arm 158 extending into the pathway of the armature 138 of the solenoid 136. When the armature 138 strikes the arm 158 at 159, the end 154 of the lever 151 is released and a hammer 98 loaded by a spring 160 strikes the underside of the clock disc and forces it towards a platen 99.

Record blanks 100 are fed from a magazine or roll 101 along the underside of the platen 99. The disc 87 of the time clock is arrested by the hammer 98 which causes an impression to be made on the blank 100 at the moment the racer passes the finish line. Thus a permanent record is made of the time elapsed between the start of the race and passage of the finish line. The printed record is then dispensed to the racer who for this purpose actuates a dispensing and resetting mechanism which will now be described.

An actuating lever 102 projects from the housing of the finish line station and carries a knob 103. The lever 102 forms a part of a bell crank assembly 104 secured to a lever shaft 105. The bell crank assembly includes a further arm 106 to which a cord 107 is attached at 108. The cord 107 runs over a pulley 109 and is trained around a clock winding disc 110. The disc 110 is loosely mounted on a winding stem 111 which serves to rewind the clockwork and to reset the clock disc 87. The rewinding disc 110 is connected to the winding stem 111 through a spring 112 which takes up the slack of the cord 107 and also permits the disc 87 to turn when the arm 106 and cord 107 are in the position shown in Figure 5.

When the actuating lever 102 is pulled down the arm 106 moves in a counter-clock-wise sense and the cord 107 is unreeled from the winding disc 110 until the spring 112 tightens whereafter the clockwork is rewound and the disc 87 is reset towards and beyond its zero position for a reason which will presently appear.

Actuation of the lever 102 causes a stub arm 165 on the lever shaft 105 to strike the angular end 151 of the lever 150 thereby tilting the lever 150 in a clockwise sense, tensioning the spring 160 and re-engaging the arm 154 with the catch assembly.

Simultaneously a further arm 113 on the bell crank assembly 104 strikes the light arm 94 of the double armed lever 91 and the latter is turned in a counter-clockwise sense about its pivot 92 until the end of the arm 93 is arrested by the armature 80 of the solenoid 75 in the position shown in Figure 5.

When the arm 93 rises to the illustrated position the clock disc 87 has been reset sufficiently to bring the arm 89 of the clock a substantial distance beyond the projection 90. This brings the arm 89 of the clock beyond a cam surface 114 on the movable contact spring 78. As soon as the actuating lever 102 is released the clock starts running and its arm 89 moves towards the stop 90 where it is arrested. On its way the arm 89 strikes the cam 114 and causes the contacts 77, 78 to be broken and the contacts 78, 81 to be closed momentarily.

Closing of the contacts 78, 81 causes both relays 65 and 70 to pull up their armatures as current flows from battery 73 through lines 14 and 15. Actuation of the relay 70 at the finish line station, however, does not cause the solenoid 75 of the finish line station to be energized since the contacts 77, 78 are broken. Therefore the solenoid armature 80 remains at rest and the clock is arrested in its zero position.

At the starting line station, however, the solenoid 56 is energized by the relay 65 which pulls up its armature 64 thus establishing a path from the battery to the solenoid as follows: From the battery 60 through leads 67, relay contacts 66, 64 lead 63 to the solenoid 56, and then through leads 62, contacts 48, 45 lead 46, coin slide contacts 39, and lead 61 back to the battery 60. This causes the starting station to be unblocked in a manner which will presently be described after brief consideration of a further mechanical operation taking place at the finish line station.

It was described that upon passage by the racer of the finish line a time record is printed. The printed record blank lies underneath the platen 99. Actuation of the lever 102 by the racer also operates a mechanism for feeding the time records in step-by-step fashion for dispensing the last printed blank to the racer.

As the arm 106 rises it strikes the horizontal arm 115 of a lever 116 pivoted at 117. The lever 116 swings about its pivot 117 in a clock-wise sense and causes a second lever 118 also pivoted at 117 to move in the same direction through a coupling spring 119 connecting the two levers 116 and 118. The lever 118 actuates a blank transport of conventional construction which comprises a carriage 120 slidable on a guideway 121 through which the blanks are fed. The carriage is biased towards its end position by a biasing spring 122. The carriage 120 carries two upright pins 123 and 124 between which the end of the lever 118 moves. The unmarked blanks are connected along interrupted cut lines 126 to permit convenient separation. Each blank has a hole 127 adapted to be engaged by a resilient feed finger 128 on the carriage 120. The finger 128 normally engages the hole in one of the blanks and upon actuation of the carriage 120 by the lever 118 pushes the strip of blanks towards the platen 99, the length of the stroke of the carriage 120 being equal to the length of one blank. When the actuating lever 102 is released the carriage 120 is pulled back to its end position by its spring 122. During this movement the feed finger 128 rises slightly and slides over the blank next to the one previously engaged until its end drops into the next hole. The carriage 120 then comes to rest against a stop 129 secured to the guideway 121. The finish line station is now restored to its initial condition and is ready for re-use.

In describing the operation of the relays and the solenoids caused by resetting the finish line station, it was mentioned that the solenoid 56 at the starting line station also is energized causing it to pull up its armature 55 (Figure 3). This causes the hammer arm 53 to drop and strike a pin 53' on the end of the rocking arm 34. This causes the arm 34 to turn clock-wisely against the action of its biasing spring 36 whereby the coin slide 26 is released. The biasing spring 28 of the coin slide pulls the slide to its projecting position in which it is shown in Figure 3. Simultaneously the longitudinal portion 33 of the angular arm 31 disengages from the contacts 39 thereby cutting off the battery 60.

Dropping of the hammer arm 53 releases the indicator by disengagement of the locking elements 54, 59 and the indicator returns to its initial position in which the signal "Insert coin" appears at the window. The apparatus is now in condition for re-use by the next racer.

A printed record blank is shown in Figure 7, The record bears a time marking 130. The marking is read at a reference line 131 which is printed on all record blanks. Minute and second readings appear on concentric circles. The record shown in Figure 7 indicates a race time of zero minutes 42.8 seconds.

The invention thus provides a simple, reliable and relatively inexpensive timing mechanism which can be used by untrained persons without the assistance of a skilled operator. The apparatus ingeniously prevents improper use or double use by the blocking arrangement which effectively blocks the starting line station against reuse during the period a racer is on the trail and until time the racer has obtained a reading or a printed record of his time. A particular feature of the invention is that the racer is compelled to reset and unblock the timing system in order to

obtain an indication or permanent record of his race time.

The device is relatively small and compact, and can easily be installed along permanent or temporary race trails. It can readily be moved to new locations and is powered by dry cell batteries. Obviously numerous additions, ommissions, substitutions or other changes can be made in the illustrated structure without departing from the essence of the invention.

What is claimed is:

1. In a timing device for measuring time elapsed between the passage by a racer of a starting line station and his passage of a finish line station, the device including first passage responsive means at the starting line station, second passage responsive means at the finish line station, an electric circuit connecting the two stations, a clock startable by said first passage responsive means, and means associated with the clock and actuable by said second passage responsive means for providing an indication of elapsed time, the improvement which comprises an element operable by the racer for rendering the device operative, said element being separate and apart from said first passage responsive means and located at the starting line station and being movable from an inactive rest position into an active position; means for locking said element in its active position after actuation by a racer; means located at the finish line station for unlocking said element, said unlocking means being coupled with the means for indicating elapsed time; and switch means in said circuit for closing and opening said circuit, said switch means being operable by said element.

2. In a timing device for measuring time elapsed between the passage by a racer of a starting line station and his passage of a finish line station, the device including first passage responsive means at the starting line station, second passage responsive means at the finish line station, an electric circuit connecting the two stations, a clock startable by said first passage responsive means, and means associated with the clock and actuable by said second passage responsive means for providing an indication of elapsed time, the improvement which comprises an element operable by the racer for rendering the device operative, said element being separate and apart from said first passage responsive means and located at the starting line station and being movable from an inactive rest position into an active position; means for locking said element in its active position after actuation by a racer; means located at the finish line station for unlocking said element, said unlocking means being coupled with the means for indicating elapsed time; indicating means at the starting line station for indicating conditions of availability for use, and nonavailability for use of the device, said last named indicating means being operatively connected with said element; and switch means in said circuit for closing and opening said circuit, said switch means being operable by said element.

3. In a timing device for measuring time elapsed between the passage by a racer of a starting line station and his passage of a finished line station, the device including first passage responsive means at the starting line station, second passage responsive means at the finish line station, an electric circuit connecting the two stations, a clock startable by said first passage responsive means, and means associated with the clock and actuable by said second passage responsive means for providing an indication of elapsed time, the improvement which comprises a coin operable slide actuable by the racer for rendering the device operative, the slide being located at the starting line station and being movable from an inactive projecting rest position into a depressed active position; means for locking said slide in its depressed position; means for biasing said slide towards its projecting position; and means located at the finish line station for unlocking said slide, said unlocking means being coupled with the means for indicating elapsed time.

4. In a timing device for measuring time elapsed between the passage by a racer of a starting line station and his passage of a finish line station, the device including first passage responsive means at the starting line station, second passage responsive means at the finish line station, an electric circuit connecting the two stations, a clock startable by said first passage responsive means, and means associated with the clock and actuable by said second passage responsive means for providing an indication of elapsed time, the improvement which comprises a coin operable slide actuable by the racer for rendering the device operative, the slide being located at the starting line station and being movable from an inactive projecting rest position into a depressed active position; means for locking said slide in its depressed position; means for biasing said slide towards its projecting position; means located at the finish line station for unlocking said slide, said unlocking means being coupled with the means for indicating elapsed time; and indicating means at the starting line station for indicating conditions of availability for use, and nonavailability for use of the device, said last named indicating means being operatively connected with said element.

5. A timing device for measuring time elapsed between the passage by a racer of a starting line and his passage of a finish line, the device comprising a starting line station, a finish line station and an electric circuit connecting the two stations, the starting line station including a first passage responsive means responsive to the passage by the racer of the starting line, a coin operable element actuable by the racer for rendering the device operative, said coin operable element being movable from an inactive rest position into an active position; means for biasing said element towards its rest position, and means for locking said element in its active position; said finish line station including a second passage responsive means responsive to the passage by the racer of the finish line, a clock actuable by said first passage responsive means through said circuit, means associated with said clock and actuable by said second passage responsive means for providing an indication of elapsed time, and means for unlocking through said circuit said element at the starting station, said unlocking means being operatively connected with the elapsed time indicating means.

6. A timing device for measuring time elapsed between the passage by a racer of a starting line and his passage of a finish line, the device comprising a starting line station, a finish line station and an electric circuit connecting the two stations, the starting line station including a first passage responsive means responsive to the passage by the racer of the starting line, a coin operable element actuable by the racer for rendering the device operative, said coin operable element being movable from an inactive rest position into an active position; means for bias-

ing said element towards its rest position, means for locking said element in its active position, and indicating means for indicating availability and nonavailability for use of the starting line station, said indicating means being operatively connected with said element; said finish line station including a second passage responsive means responsive to the passage by the racer of the finish line, a clock actuable by said first passage responsive means through said circuit, means associated with said clock and actuable by said second passage responsive means for providing an indication of elapsed time, and means for unlocking through said circuit said element at the starting station, said unlocking means being operatively connected with the elapsed time indicating means.

7. A timing device for measuring time elapsed between the passage by a racer of a starting line and his passage of a finish line, the device comprising a starting line station, a finish line station and an electric circuit connecting the two stations, the starting line station including a first passage responsive means responsive to the passage by the racer of the starting line, a coin operable slide actuable by the racer for rendering the device operative, said slide being movable from an inactive projecting rest position into a depressed active position, a spring for biasing said slide towards its projecting position, means for locking said slide in its active position, and indicating means jointly operable by said slide and said first passage responsive means for indicating conditions of availability for use when the slide is in its projecting position, readiness for use when the slide is in depressed position prior to actuation of said first passage responsive means and nonavailability for use after actuation of said first passage responsive means; said finish line station including a second passage responsive means responsive to the passage by the racer of the finish line, a clock actuable by said first passage responsive means through said circuit, means associated with said clock and actuable by said second passage responsive means for providing an indication of elapsed time, and means for unlocking through said circuit said slide at the starting station, said unlocking means being operatively connected with the elapsed time indicating means.

8. A timing device for measuring time elapsed between the passage by a racer of a starting line and his passage of a finish line, the device comprising a starting line station, a finish line station and an electric circuit connecting the two stations, the starting line station including a first passage responsive means responsive to the passage by the racer of the starting line, a coin operable element actuable by the racer for rendering the device operative, said coin operable element being movable from an inactive rest position into an active position; means for biasing said element towards its rest position, and means for locking said element in its active position; said finish line station including a second passage responsive means responsive to the passage by the racer of the finish line, a clock actuable by said first passage responsive means through said circuit, printing means associated with said clock and actuable by said second passage responsive means for providing a printed record of elapsed time, and means for unlocking through said circuit said element at the starting station said unlocking means being operatively connected with the elapsed time indicating means.

9. A timing device for measuring time elapsed between the passage by a racer of a starting line and his passage of a finish line, the device comprising a starting line station, a finish line station and an electric circuit connecting the two stations, the starting line station including a first passage responsive means responsive to the passage by the racer of the starting line, a coin operable element actuable by the racer for rendering the device operative, said coin operable element being movable from an inactive rest position into an active position; means for biasing said element towards its rest position; means for locking said element in its active position, and indicating means for indicating availability and nonavailability for use of the starting line station, said indicating means being operatively connected with said element; said finish line station including a second passage responsive means responsive to the passage by the racer of the finish line, a clock actuable by said first passage responsive means through said circuit, a supply of time record blanks, means associated with said clock and actuable by said second passage responsive means for printing on a blank a record of elapsed time, manually operable means for dispensing a printed time record, and means for unlocking through said circuit said slide at the starting station, said unlocking means being operatively connected with said dispensing means.

10. A timing device for measuring time elapsed between the passage by a racer of a starting line and his passage of a finish line, the device comprising a starting line station, a finish line station and an electric circuit connecting the two stations, the starting line station including a first passage responsive means responsive to the passage by the racer of the starting line, a coin operable slide actuable by the racer for rendering the device operative, said slide being movable from an inactive projecting rest position into a depressed active position, a spring for biasing said slide towards its projecting position, means for locking said slide in its active position, and indicating means jointly operable by said slide and said first passage responsive means for indicating conditions of availability for use when the slide is in its projecting position, readiness for use when the slide is in depressed position prior to actuation of said first passage responsive means and nonavailability for use after actuation of said first passage responsive means; said finish line station including a second passage responsive means responsive to the passage by the racer of the finish line, a clock actuable by said first passage responsive means through said circuit, a supply of time record blanks, means associated with said clock and actuable by said second passage responsive means for printing on a blank a record of elapsed time, and a manually operable means for dispensing a printed time record, said manually operable dispensing means being connected with said clock for resetting it and being connected through said circuit with said locking means to release said locking means.

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