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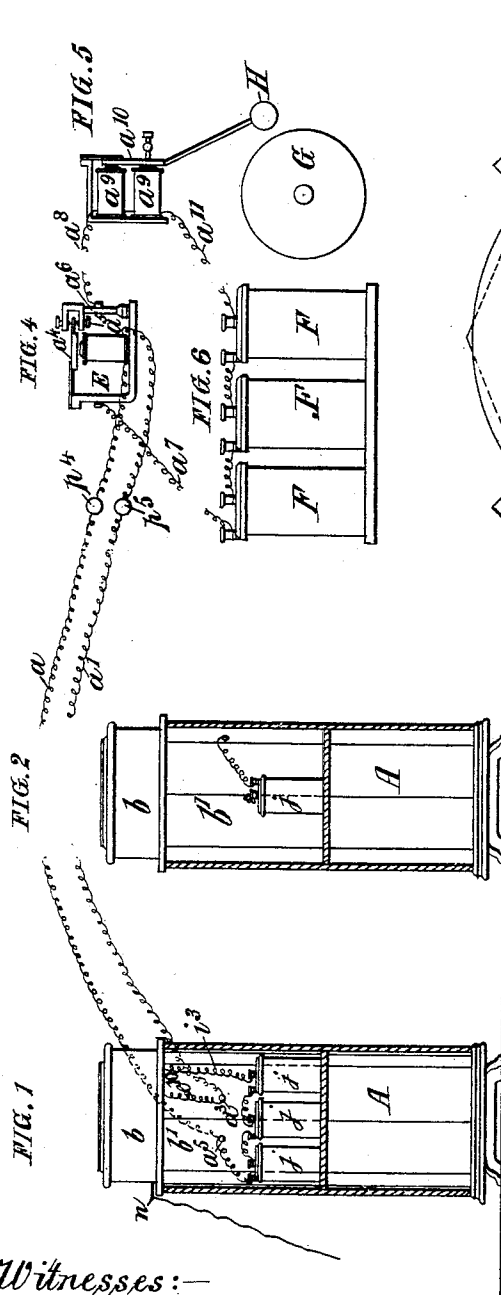
3 Sheets—Sheet 1.

A. BARTLETT.

TIME INDICATOR AND SIGNAL FOR RACES.

No. 495,770.

Patented Apr. 18, 1893.



Witnesses:—
Ernest S. Baldwin
J. Richardson

Inventor.
Myrd Bartlett
per McLaughlin
Attorney

(No Model.)

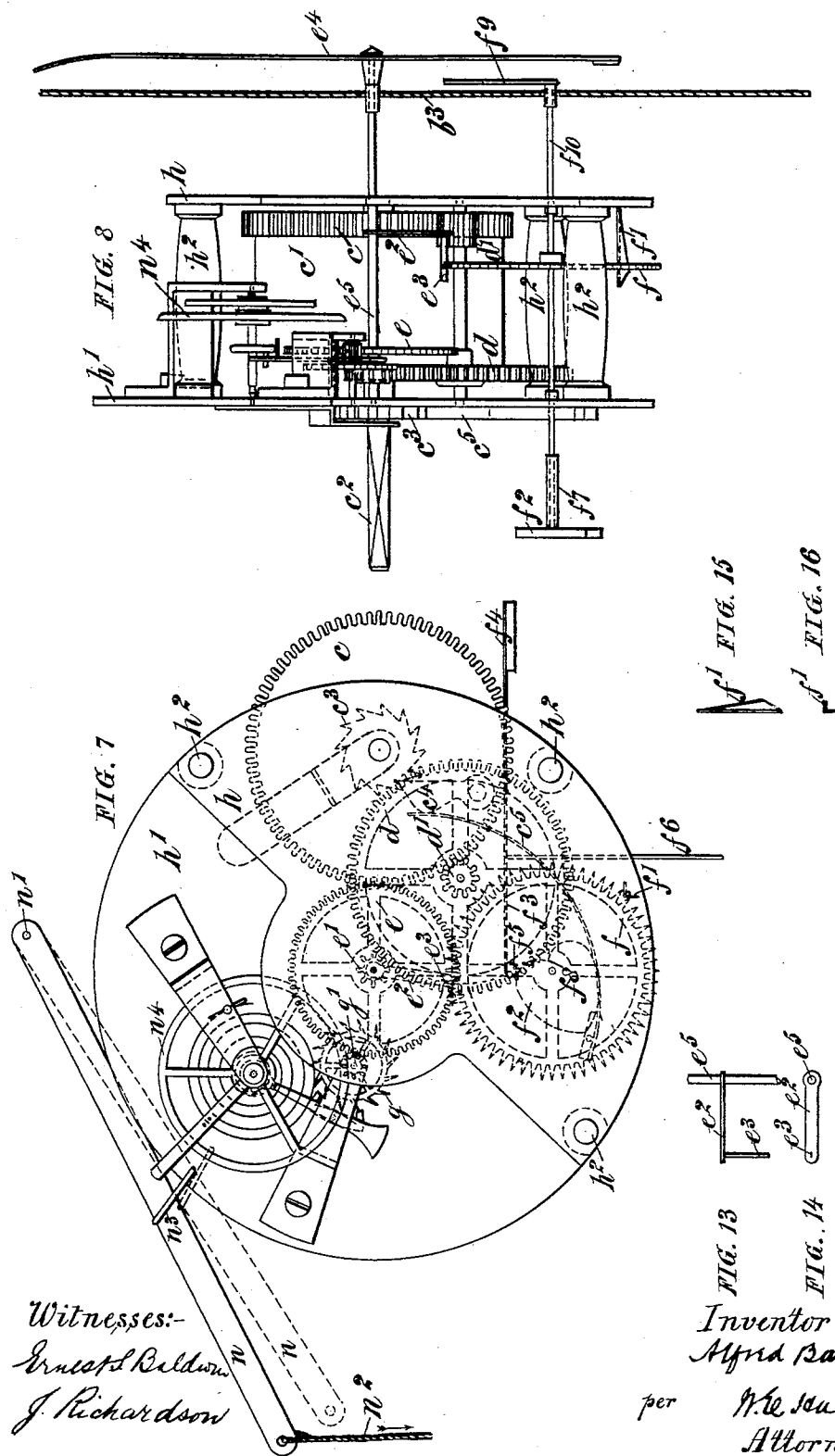
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A. BARTLETT.

TIME INDICATOR AND SIGNAL FOR RACES.

No. 495,770.

Patented Apr. 18, 1893.



Witnesses:
Ernest Riddow
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Inventor
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(No Model.)

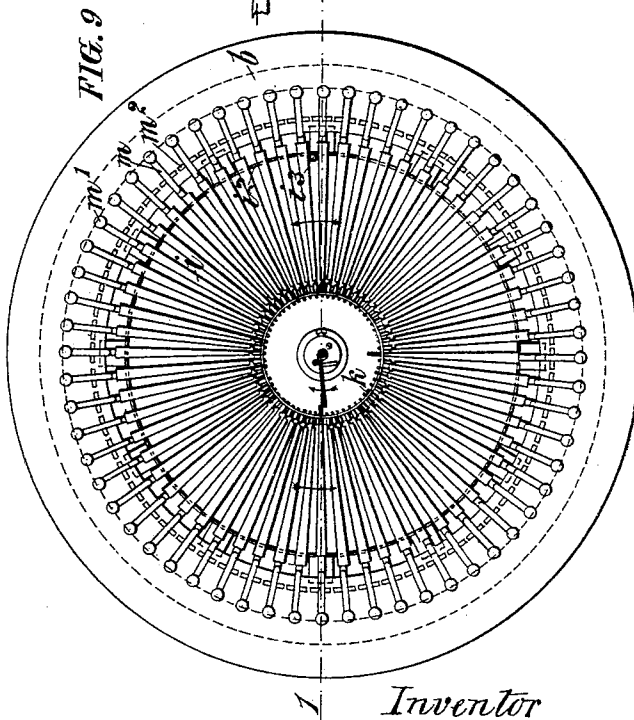
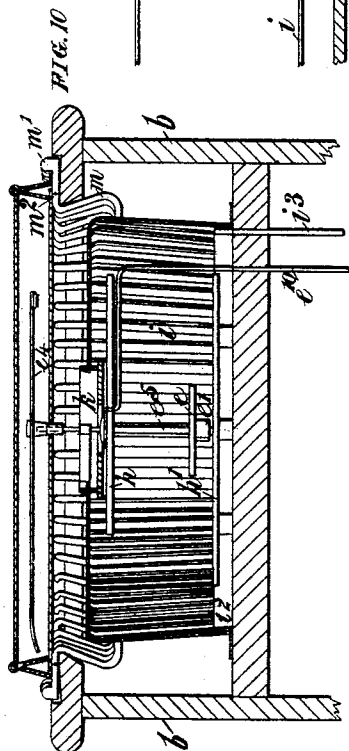
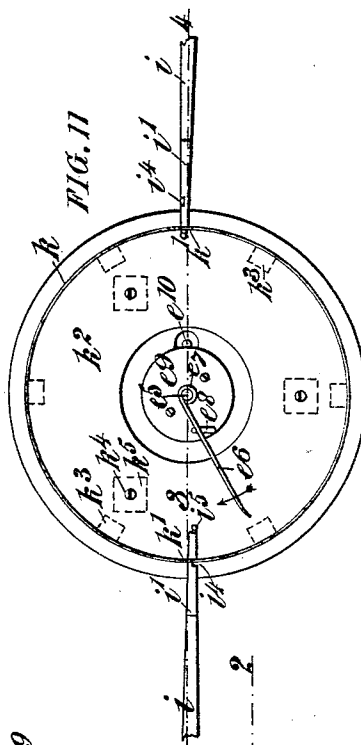
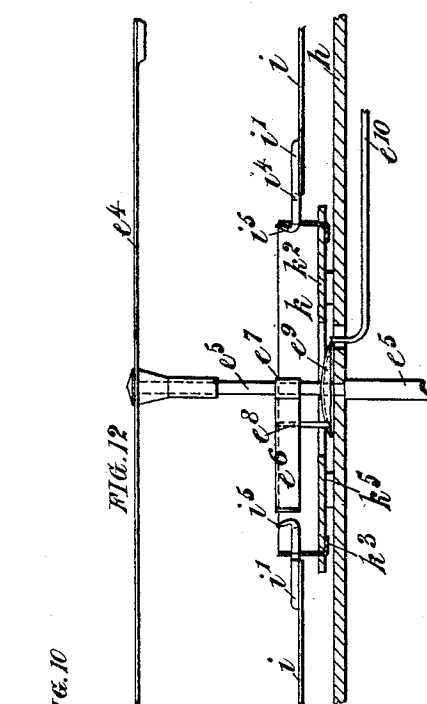
3 Sheets—Sheet 3.

A. BARTLETT.

TIME INDICATOR AND SIGNAL FOR RACES.

No. 495,770.

Patented Apr. 18, 1893.



Witnesses:-
Ernest S. Baldwin
J. Richardson

Inventor
 Aynd Bartlett
 per Wm. Hughes
 Attorney

UNITED STATES PATENT OFFICE.

ALFRED BARTLETT, OF AUCKLAND, NEW ZEALAND.

TIME-INDICATOR AND SIGNAL FOR RACES.

SPECIFICATION forming part of Letters Patent No. 495,770, dated April 18, 1893.

Application filed March 24, 1892. Serial No. 426,314. (No model.) Patented in New Zealand October 27, 1891, No. 5,253; in New South Wales December 1, 1891, No. 3,444; in Victoria December 10, 1891, No. 9,308, and in England January 23, 1892, No. 1,365.

To all whom it may concern:

Be it known that I, ALFRED BARTLETT, a British subject, residing at Auckland, in the Colony of New Zealand, have invented new and useful Improvements in Apparatus for Starting Races and Recording the Results of the Same, (which has been patented in New Zealand, No. 5,253, dated October 27, 1891; in New South Wales, No. 3,444, dated December 1, 1891; in Victoria, No. 9,308, dated December 10, 1891, and in Great Britain, No. 1,365, dated January 23, 1892,) of which the following is a specification.

My invention relates to improvements in apparatus where a bell or other alarm is sounded for starting races; for automatically handicapping the same when time allowances are made; and which apparatus correctly and automatically records the time of the race; and has for its objects performing these operations in a simple and effective manner by suitable mechanism. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1, is a view of the case or stand; the part of which *b*, shown in elevation contains my clock work mechanism and the part in section contains an electric battery. Fig. 2, is a side view of the same similarly in elevation and section. Fig. 3, is a plan of the same, showing the seconds and minute circles on a larger scale. Fig. 4, is an electrical relay. Fig. 5, shows an electro magnet and armature with clapper and bell or gong attached. Fig. 6, is an auxiliary electric battery. Figs. 1 to 6, inclusive show the arrangement of my apparatus. Fig. 7, is a plan of my clock work mechanism with the clock dial removed. Fig. 8, is a side view of the same and shows the clock dial and hands. Fig. 9, is a plan of my contact making apparatus. Fig. 10, is a sectional elevation of the same on the line 1—2 (Fig. 9). Fig. 11, is a plan of the center part of the contact making apparatus on a larger scale. Fig. 12, is a sectional elevation of the same on the line 3—4 (Fig. 11). Figs. 13, 14, 15, and 16 are views of details.

Similar letters of reference indicate similar and corresponding parts in all the figures.

When my apparatus is used for starting,

timing, and handicapping races the case or stand A, shown in Figs. 1, 2 and 3 is placed at the winning post; and the electrical apparatus and bell or gong shown in Figs. 4, 5 and 6 at any desired and convenient starting point. These two parts are connected by the insulated wires *a* and *a'*, which may be of any suitable length, and are for a purpose to be hereinafter described.

The part of my apparatus situated at the winning post consists, first, of a stop clock inclosed in part *b*, of the case or stand A, and is shown on an enlarged scale in Figs. 7 and 8. It will be seen that this clock which is constructed to indicate fourth parts of seconds has a train of wheels and pinions in which the great wheel *c* has eighty teeth, the second wheel *d*, seventy-two teeth and pinion *d'*, ten leaves; third or center wheel *e*, sixty-four teeth; and pinion *e'*, eight leaves; minute wheel *f*, sixty teeth; scape wheel *g*, fifteen teeth; and pinion *g'*, eight leaves. The escapement is similar in construction to ordinary right angled lever clock escapements. The main spring is inclosed in the barrel *c'*, which forms part of and is in one piece with the great wheel *c*. *h*, is the upper clock plate shaped as shown, and *h'*, the lower clock plate which is circular in shape (by preference). These plates are held together by pillars *h*², in any ordinary manner and form the framing in which the clock mechanism works. The center wheel *e*, is provided with a detent *e*² (shown in detail in Figs. 13 and 14) which once every revolution of the said center wheel engages with the minute wheel *f*, advancing the same one tooth and the minute hand *f*³, one division of the minute circle *b*⁴, (Fig. 3). The depending arm *e*³, of the detent *e*², is made of fine spring steel and thus allows the said minute wheel *f*, to be turned backward and forward while engaged with the said detent. *f*¹, shown in detail in Figs. 15 and 16, is a check spring bearing with a light pressure against the teeth of the minute wheel *f*, and thus preventing the same moving when not engaged with the detent. *f*², is a flat piece of brass or other suitable metal shaped as shown and is provided with a socket *f*⁷, which fits tightly on to the lower end of the

minute wheel arbor f^{10} . f^3 , is a spring fixed at f^4 , in any suitable manner to the case A. This spring is provided with a point f^5 , and a wire f^6 , the outer end of which projects beyond the case or stand A as shown in Fig. 3. It will be evident that when the end of the said wire f^6 , is pulled the pressure of the point f^5 , on the plate f^2 , will cause the minute wheel to revolve until the said point arrives at f^8 . When the point f^5 , is in that position the minute hand f^9 , which fits tightly on to the upper end of the said minute wheel arbor f^{10} , always points to 60 on the minute circle. e^4 , is the seconds hand fitting tightly on to the center wheel arbor e^5 , as shown. c^2 , is the winding square fitted with ratchet wheel c^3 , click or pawl c^4 , and click spring c^5 . n , (Figs. 1, 3 and 7) is a lever fixed in any convenient position on the case or stand A, and fulcrumed on a pin n' ; this lever n , is provided with a cord n^2 , and an arm n^3 . It will be seen by reference to the drawings Fig. 7 that when the cord n^2 , is pulled in the direction shown by the arrow the said lever n , is advanced to the position shown by the dotted lines, the said arm n^3 , pressed against the balance n^4 , and the clock instantly stopped. It will also be seen (Figs. 1 and 3) that the free end of this lever projects out from the case or stand A. It consists secondly, of mechanism shown in Figs. 9, 10, 11 and 12 for making electrical contact and thus in conjunction with the hereinbefore described stop clock, sounding a bell or other alarm at desired times or intervals for starting and handicapping races by time allowances. This mechanism is (for convenience) inclosed in part b , of the case or stand A (see Figs. 1 and 2) and immediately above and around the stop clock (see Fig. 10). In this part of my apparatus, i, i , are springs shaped as shown and of a number to correspond with the sixty seconds on the clock dial b^3 , (Fig. 3.) These springs are made of brass (by preference) and are provided with points i' , (see Figs. 11 and 12) made preferably of silver or other suitable metal which is a good conductor of electricity and does not easily corrode, and have grooves or notches i^4 , and contact points i^5 , and are so constructed as to exert their energy in the direction of the arrows (Fig. 9) in an opposite or contrary direction to the revolution of the center wheel arbor e^5 , of the clock mechanism. They also press outwardly and radially. i^2 , (Fig. 10) is a brass band connecting the said springs together and having a wire i^3 , attached, which is connected with the battery j , (Fig. 1.) k , (Figs. 11 and 12) is a brass ring perforated with slots k' , for the reception of the points i' , two of which are shown in position. This ring k , is fixed by nibs k^3 , to a disk of vulcanite k^2 , or other suitable non-conductor of electricity thus insulating the same from the clock plate h . The said vulcanite disk is perforated as shown and fixed to the clock plate h , by screws k^4 , and separated therefrom by distance pieces k^5 . m , (Figs. 9 and 10) are

levers provided with knobs or keys m' , corresponding in number with the sixty seconds marked on the seconds circle b^5 (Fig. 3.) These levers are bent as shown and fulcrumed on pins m^2 . When one of the knobs or keys m' , is depressed it will be evident by reference to the drawings that from the position and peculiar shape of these levers m , one of the springs i before described is advanced until its groove or notch i^4 , (Fig. 11) engages with the ring k , where it is held by the pressure exerted by the said spring i . e^6 , (Figs. 11 and 12) is an arm having a socket e^7 , both made preferably of silver, fitting tightly on and traveling with the center wheel arbor e^5 . e^8 , is a depending spring made preferably of silver, fixed to the arm e^6 , and bearing on the disk e^9 , made also by preference of silver. This disk e^9 , has a wire e^{10} , attached for a purpose to be hereinafter described.

It consists thirdly, of an ordinary three cell Leclanché or other suitable electric battery inclosed (for convenience) in part b' , of the case or stand A.

The part of my apparatus situated at the starting point consists of an electric relay E (Fig. 4); a three cell Leclanché or other suitable electric battery F (Fig. 6); and an ordinary electro magnet with gong or bell G, and clapper H, (Fig. 5) inclosed in a suitable case for convenience of handling and transport. By reference to the drawings (Figs. 4, 5 and 6) this arrangement will be readily understood by one skilled in the art to which it appertains; being apparatus similar to that ordinarily used for operating bells by electricity when one blow at a time on the bell by the clapper is desired.

Having now described the several parts of my apparatus, I will proceed to describe the method of operating the same.

The part of my apparatus illustrated in Figs. 1, 2, and 3; and shown in detail in Figs. 7, 8, 9, 10, 11, 12, 13, 14, 15 and 16, being placed at the winning post and the part of my apparatus shown in Figs. 4, 5 and 6, at the starting point and connected together by the insulated wires a and a' as shown, the person in charge of the race pulls the lever n , and thus stops the clock, as before described, at say a second before the seconds hand e^4 , reaches the division marked 60 on the seconds circle b^5 , (Fig. 3) and then depresses the key or knob m' , corresponding to the said division marked 60 on the seconds circle b^5 . The object of thus stopping the clock at a second before the hand reaches the division 60 is, that when the competitors are ready, as little time as possible shall be lost in starting the race; for when the said hand reaches division 60 corresponding to the key which has been depressed as stated, the bell G, is sounded at the starting point by electrical contact being made with the same in the following manner:—The arm e^6 is so situated in relation to the seconds hand e^4 , that when the latter is over the division corresponding to the key m' , which has been de-

pressed, electrical contact is made between the said arm e^6 and the point i^5 , of the spring i , which has been previously advanced by the depressed key m' , thus connecting the wire e^{10} , through the disk e^9 , spring e^8 , arm e^6 , point i^5 , spring i , (Figs. 11 and 12) band i^2 to the wire i^3 , (Fig. 10.) The wire e^{10} being connected to the wire a' , (Figs. 1 and 4) by means of the contact screw a^3 ; and the wire i^3 , connected to the battery j , electrical energy is exerted along the wire a' , to the relay E, (Fig. 4) depressing the armature a^4 , and completing the circuit along the wire a , through the contact screw a^5 . Electrical energy is now exerted from the battery F, (Fig. 6) along the wire a^7 , through the armature a^4 , contact screw a^5 , pillar a^6 , wire a^8 , and coil a^9 , depressing the armature a^{10} , and clapper H, which strikes the bell or gong G, or other alarm and gives the signal to start the race. The circuit is completed along the wire a^{11} , to the battery F. The arm e^6 (Figs. 11 and 12) continuing to advance carries with it the point i^5 , (Fig. 11) until the groove or notch i^4 , is disengaged from the slot k' , in the ring k , and the said point released by the spring i . The electric circuits are thus broken, when the mechanism is ready to be re-operated.

Having thus described the method of starting a race automatically by my apparatus I will now explain how the same can be automatically and correctly timed.

A cord or tape is stretched across the track at the winning post in the usual manner but fastened at one end to the stop work lever n , (Figs. 1, 3 and 7.) It will be readily understood that immediately the foremost competitor comes into contact with the said tape or cord, the lever n , will be pulled in the direction of the arrow and the clock stopped simultaneously and automatically by the stop work mechanism hereinbefore described (see Fig. 7) and thus a correct record of the time will be indicated. The said cord or tape is preferably made of such a thickness that it will break after operating the stop work lever n .

Having thus described the methods of starting and automatically timing a race by my apparatus I will now explain how the same can be used for automatically handicapping a race by time allowances.

If for instance it is desired to start a race of three competitors in which No. 1 competitor allows No. 2 eight seconds and No. 3 fifteen seconds, the manner of operating my apparatus is as follows:—The person in charge of the race arranges the apparatus, stops the clock at one second before the division marked 60, on the seconds circle b^5 , (Fig. 3) as described herein for starting and timing a race where no time allowances are made, and also depresses the keys m' , corresponding to the divisions marked 60, 8 and 15. The competitors being ready the clock is started. No. 3 starts when the gong sounds the first time, which will be when the seconds hand of the clock points to 60; No. 2 starts when the gong

sounds the second time which will be when the seconds hand points to 8; and No. 1 starts when the gong sounds a third time which will be when the seconds hand points to 15. The race is timed in the manner before described.

The stop clock as described is constructed to beat four times per second, but it is obvious that the train of wheels may be so arranged as to beat any other desired fractions of seconds. For instance if it is desired to arrange the clock to beat five times per second I should make the train as follows:—Center wheel e , sixty teeth, and escape wheel pinion g' , six leaves; or any other convenient number of teeth and leaves having the same relative proportion; the remainder of the mechanism being unaltered.

By increasing the number of stops m' , and springs i , my apparatus may be arranged to sound the gong at any desired intervals less than a second.

The dial b^3 , may be arranged vertically instead of horizontally as shown, or the mechanism constructed to indicate the time on two or more dials in the manner usual in such cases.

Having now fully described my invention and how the same is or may be carried into effect, I wish it to be understood that what I claim, and desire to secure by Letters Patent of the United States, is—

1. In an apparatus for starting races and indicating the results of the same, the detent e^2 , depending arm e^3 , combined with minute wheel f , and check spring f' , as and for the purposes substantially as set forth and described.

2. In an apparatus for starting races and indicating the results of the same, the lever n , having cord n^2 , and arm n^3 , as and for the purposes substantially as set forth and described.

3. In an apparatus for starting races and indicating the results of the same, the combination of the levers m , having keys m' , with the springs i , and insulated ring k , as and for the purposes substantially as set forth and described.

4. In an apparatus for starting races and indicating the results of the same, the combination of the levers m , having keys m' , springs i , insulated ring k , and arm e^6 , actuated by the stop clock as and for the purposes substantially as set forth and described.

5. In an apparatus for starting races and indicating the results of the same, a stop clock such as described, springs i , with levers m , having keys m' , insulated ring k , combined with arm e^6 , attached to wheel arbor e^5 , disk e^9 , wire e^{10} , connecting with electrical apparatus and bell as and for the purposes all substantially as set forth.

ALFRED BARTLETT.

Witnesses:

H. STREET,
W. E. HUGHES.