

Sept. 15, 1936.

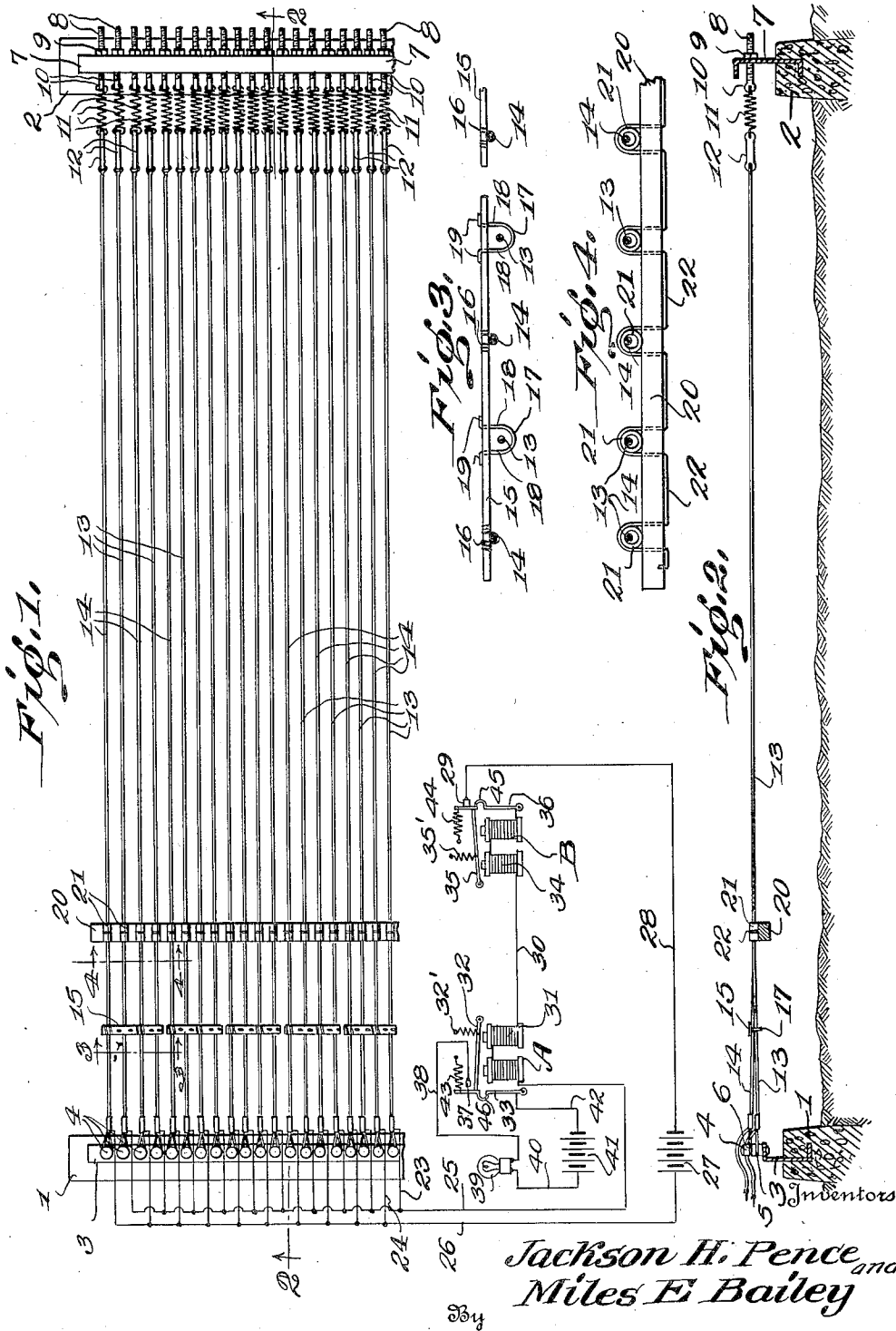
J. H. PENCE ET AL

2,054,604

INDICATOR

Filed Dec. 13, 1930

2 Sheets-Sheet 1



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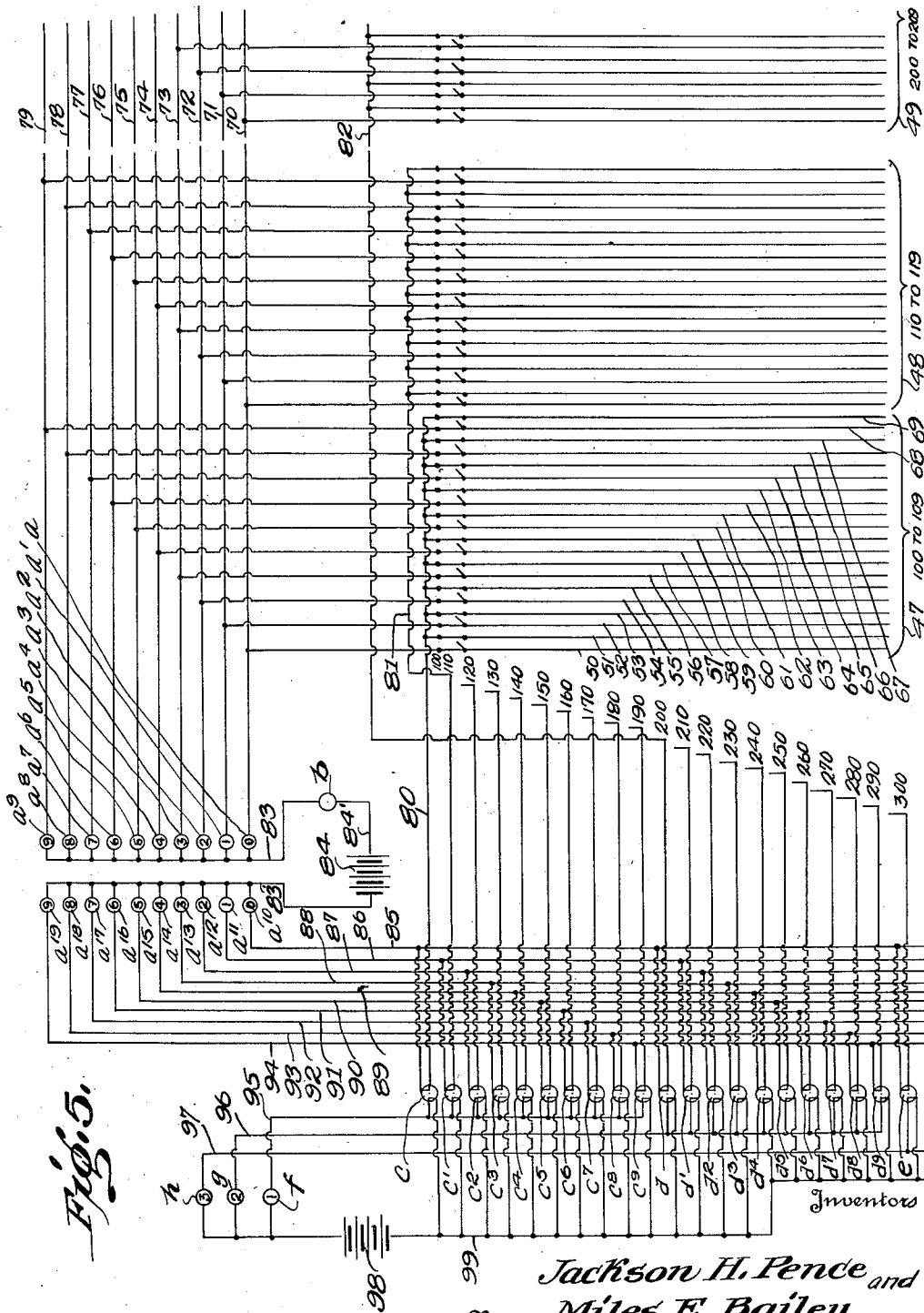
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Jackson H. Pence and
Miles E. Bailey

Milan & Milan, Attorneys

UNITED STATES PATENT OFFICE

2,054,604

INDICATOR

Jackson H. Pence and Miles E. Bailey,
Washington, D. C.

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4 Claims. (Cl. 177—384)

Our invention relates to new and useful improvements in indicators and while primarily intended for indicating the distance that a golf ball is driven might equally as well be used for indicating the distance that a baseball is batted or thrown, the distance that a tennis ball is batted, and with the contact members arranged in vertical position as distinguished from the horizontal position disclosed in the drawings may be used as a target in rifle or pistol practice.

Since the introduction of the game of golf controversies have many times arisen as to the distance that a ball might be driven by different players and more recently courses have been established, known by various names such as practice or driving courses, in which a person endeavors to see how far he may drive a golf ball or the like and so far as we are aware in such courses it has been the practice to place markers at certain distances to indicate the length of drive. However, with the use of these markers it is only a guess, so to speak, as to how far the ball has actually been driven for it can be appreciated that it is hard for the eye to distinguish the exact point that the ball hits in the field or course and as the ball will roll over the ground an accurate idea of distance as to the drive cannot be gained by noting the point that the ball stops rolling. Where we have referred to the distance of the drive it will be understood that we have reference to the actual flight in the air as distinguished from any additional distance which may be gained by the rolling of the object, etc.

To overcome the inaccuracies, or guess, now prevalent in these practice or drive courses, we have perfected our improved form of indicator which is operated by contact of the ball with members, such as wires, stretched across the field or course. The construction of our device is such that the distance that the ball is driven in flight is accurately indicated and no matter how far the ball may roll after hitting the ground or surface an accurate indication is given as to just how far the ball went in actual flight or the actual length of the drive.

With the above objects in mind we have perfected an indicator which will be accurate in operation at all times. Means have also been provided so that after the initial contact of the ball for operating the indicator there will be no further indication even should the ball "bounce" over the field and engage other of the contact members.

With the above and other objects in view, which will appear as the description proceeds, our in-

vention consists in the novel details of construction, and arrangement of parts, described in the following specification and illustrated in the accompanying drawings, and while we have illustrated and described the preferred embodiments of the invention, as they now appear to us, it will be understood that such changes may be made as will fall within the scope of the appended claims.

In the drawings:—

Fig. 1 is a fragmentary top plan of a single unit with the circuits shown diagrammatically.

Fig. 2 is a section on the line 2—2 of Fig. 1 looking in the direction of the arrows.

Fig. 3 is a section on the line 3—3 of Fig. 1 looking in the direction of the arrows.

Fig. 4 is a section on the line 4—4 of Fig. 1 looking in the direction of the arrows; and

Fig. 5 is a diagrammatic view of a multiplicity of units showing the manner in which the indicators are operated through the closing of different circuits.

As stated in the brief description of the figures we have illustrated in Fig. 1 of the drawings a portion of a single unit of contact members adapted for operating a single indicator whereas in Fig. 3 we have illustrated a multiplicity of units of contact members for operating a multiplicity of indicators. The contact members are illustrated as wires which are arranged transversely of the course or field to the desired length and as many wires will be used as found necessary to cover an area embracing the distance of what may be termed the shortest probable drive and the longest possible drive. In other words say that the shortest drive is ordinarily 100 yards distance then the first contact wire will be positioned 100 yards from the point where the person or player stands and if the greatest distance of a drive is 300 yards the last contact wire will be positioned 300 yards from the point where the player or person stands for making the drive. Preferably the wire contact members will be spaced approximately one inch apart to provide thirty-six of such contact wires to every yard of drive and it will be understood that when desirable or necessary wires may be placed nearer the point where the player stands or extended for a greater distance away from the player or person. The transverse length of the contact wires may be such as to cover the desired width over the course or field.

In carrying forward our invention we provide the concrete bases 1 and 2 which will be spaced apart transversely the desired distance as shown more particularly in Figs. 1 and 2 of the drawings

and supported by concrete or other means 1 is the lower portion of an angle iron member 3 to the upper flange of which is secured a plurality of longitudinally spaced insulators 4, each of these 5 insulators having a pair of vertically spaced grooves, the lower groove being shown at 5 whereas the upper groove is shown at 6. Embedded in the concrete base 2 is the lower portion of an angle iron member 7 through the vertical web of which extend the longitudinally spaced screws 8 10 secured in position by means of the nuts 9, the screws 8 having on their inner ends the eyes 10 in each of which is secured one end of a coiled spring 11. To the opposite end of each of the 15 coiled springs 11 is secured an insulator 12.

The contact wires are arranged in pairs, (positive and negative) the wires of each pair being indicated at 13 and 14. As has been previously stated, the wires are preferably arranged one inch 20 apart and one end of each of the wires is secured to an insulator 12. The opposite ends of the wires are secured to the insulators 4, the ends of the wires 13 being secured in the lower grooves 5 of alternating insulators and the ends of the wires 14 being secured in the upper groove 6 of alternating 25 insulators. As shown more particularly in Fig. 2 of the drawings the ends of the wires 13 secured to the insulators 4 will be on a lower plane than the ends of the wires 14 for a purpose which will be later apparent.

At 15 we have indicated longitudinally spaced bars to which the wires 14 are secured by means of the tie wires 16. Carried by and depending 35 from the bars 15 are the loop members 17, the arms 18 of which pass through openings in the bar and the ends 19 of the arms are bent outwardly and soldered to limit the downward movement of the loops. The wires 13 extend through these loop members 17 and are normally spaced there- 40 from as shown more particularly in Fig. 3 of the drawings. By having the ends of the wires 14 on a higher plane than the ends of the wires 13 it will be seen that the wires 14 contact with the under surface of the bars 15 whereas the wires 13 45 will be spaced from the loop members 17. As shown in Fig. 1 of the drawings the bars 15 are preferably of such a length as to have two of the wires 14 secured thereto and loop members for two of the wires 13. However, these bars could 50 be made of different lengths, if desired.

It will be appreciated that when the contact wires 13 and 14 are engaged by a ball or similar missile that they will necessarily vibrate and in order to prevent excessive vibration some form 55 of dampener should be provided. For this purpose we provide the bar 20, of wood or other suitable material which has secured thereto a plurality of sleeves or tubes 21, of rubber or other suitable material, through which the wires 13 and 14 60 extend as shown more particularly in Fig. 4 of the drawings. These sleeves or tubes are secured to the bar by means of the wire 22 which, as shown, is threaded through the bar to extend over the tubes or sleeves and to draw them into tight en- 65 gagement with the upper surface of the bar. With the construction described the bar 20 is held suspended by means of the wires 13 and 14 and acts to limit excessive vibrations of the wires to the size of the bore of the sleeves or tubes and to shorten the time contacts continued to be made 70 and to shorten the angle due to wire 14 being higher than wire 13.

Secured to the wires 13 and 14 respectively, are the lead wires 23 and 24, the wires 23 being in 75 turn connected to the wire 25 which leads to the

relay A. Each of the lead wires 24 is in turn connected to a wire 26 which leads to a battery shown at 27 and leading from the opposite side of the battery 27 is a wire 28 having its opposite end connected to a contact member 29 forming a part of 5 the breaker B. The relay A and breaker B are connected by the wire 30. The relay A includes the electromagnet 31, armature 32 and lock arm 33 while the breaker B includes the electromagnet 34, the armature 35, and lock arm 36. At 37 10 we have indicated a contact from which leads a wire 38 to the indicator 39 shown as an electric light bulb. Extending from the indicator 39 is a wire 40 having its opposite end connected to a 15 battery 41, a wire 42 leading from the opposite side of the battery with its end connected to the lock arm 33 of the relay A. The upper end of the lock arm 33 is normally drawn towards the electromagnet 31 by means of a coiled spring 43 and a similar spring 44 normally draws the upper end 20 of the lock arm 36 of the breaker B towards the electromagnet 34. Spring 32' draws the armature 32 away from the electromagnet 31 and spring 35' draws the armature 35 away from electromagnet 25 34.

In Fig. 1 of the drawings we have shown the parts in their normal or inoperative position with the electromagnets 31 and 34 of the relay A and breaker B respectively de-energized and the armatures 32 and 35 held in raised position. In this position the indicator is not operated. Presuming that the player drives a golf ball or a similar missile is driven or thrown towards the area covered by the wires it will in its fall engage at least one of the wires 13 and 14 and no matter which of the 35 wires is engaged a sufficient vibration will be caused to engage one of the wires 13 with its associated loop member 17. If a wire 13 is engaged it will naturally be vibrated into contact with the loop member but if one of the wires 14 is engaged, it being secured to the bar 15, it will so vibrate the bar as to cause contact of a loop member 17 with its associated wire 13. When a wire 13 is engaged with a loop member 17 it completes a circuit 45 through the adjacent wire 14 and with this closing of the circuit current will pass through the lead wire 24 connected to the contact wire 14 through the wire 26, battery 27, wire 28, contact 29, and lock arm 36 to the electromagnet 34 of the breaker B, it being understood that the upper end 50 of the lock arm 36 is normally in engagement with the contact 29. When lowered the end of the armature 35 will be received in the offset portion 45 of the lock arm. The current from the breaker B flows to the electromagnet 31 of the relay A 55 and energizes the same so as to attract the armature 32 and release the lock arm 33. The end of the armature when lowered will be received in the offset portion 46 of the arm and as the arm is released the upper end thereof will engage the contact 37 and through the wire 38 operate the indicator 39 which is connected to the battery 41 by means of the wire 40 and connected from the battery to the lock arm 33 by the wire 42. When 60 the breaker B is operated the contact of the arm 36 with the contact member 29 is broken so that even should the ball bounce in passing over the ground and contact with another of the wires the indicator or indicators would not be further affected. It can readily be appreciated that in its 70 flight the ball might hit those contact wires of the hundred yard group and operate that indicator and in bouncing over the surface later engage the contact wires of a 200 yard group and operate the indicator of that group if the circuit was not 75

broken through the breaker B. The parts may be reset to their normal position either automatically or manually as desired after vibration has been sufficiently limited to cease making contact.

5 In Fig. 5 of the drawings we have indicated a lay-out or arrangement of circuits whereby a plurality of indicator lights or other signals are operated through means of contact wires making up a plurality of groups and while the manner of operating is the same as shown in Fig. 1
10 where but a single signal indicator light or signal is shown operated from the contact wires of a single unit, we will use for the sake of clearness, separate reference characters although referring to similar parts disclosed in Fig. 1. In Fig. 5
15 the contact wires embraced within the group designated by the bracket 47 cover an area from 100 to 109 yards, the contact wires embraced within the bracket 48 cover the area between 110
20 and 119 yards, and the contact wires embraced within the bracket 49 cover the area from 200 to 209 yards. In the groups embraced by the brackets we have shown twenty wires as covering a distance of ten yards or two wires for each
25 yard. However, it will be understood that in practice there will actually be thirty-six wires for each yard or three hundred and sixty wires covering an area of ten yards. Each group within the brackets 47, 48 and 49 consists of the wires
30 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68 and 69 the wires 50, 52, 54, 56, 58, 60, 62, 64, 66 and 68 of each group being connected respectively to the wires 70, 71, 72, 73, 74,
35 75, 76, 77, 78 and 79 while the wires 51, 53, 55, 57, 59, 61, 63, 65, 67, and 69 of the group 47 are connected to the wire 80. Similar wires of the group 48 are connected to the wire 81 and similar
40 wires of the group 49 are connected to the wire 82. The wires 70 to 79 inclusive lead to and are connected to the relays a , a' , a^2 , a^3 , a^4 , a^5 , a^6 , a^7 , a^8 and a^9 which control the indicator lights or signals designated by the numerals within the circles, these signal lights or indicators being what
45 might be termed the unit indicators or signals. Similar relays are shown at a^{10} , a^{11} , a^{12} , a^{13} , a^{14} , a^{15} , a^{16} , a^{17} , a^{18} , and a^{19} which control what might be termed the "tens" signals or indicators designated within the circles. The relays a to a^{19}
50 inclusive are similar to the relays A in Fig. 1 of the drawings. Wire 83 is connected to the relays a to a^9 inclusive and leads to the breaker b similar to the breaker B shown in Fig. 1. A wire 83' is connected to and leads from the relays a^{10} to a^{19} inclusive and is connected to the battery
55 84 corresponding to the battery 27 of Fig. 1. A wire 84' leads from the battery to the breaker b. It will be understood that a source of power such as a battery must be provided for the signal lights or indicators embraced within the relays
60 a to a^{19} corresponding to the battery 41 of Fig. 1 but this has not been shown for the sake of simplicity in illustration. Leading from the relays a^{10} to a^{19} respectively are the wires 85, 86, 87, 88, 89, 90, 91, 92, 93 and 94, these wires being respectively
65 connected to the relays c , c' , c^2 , c^3 , c^4 , c^5 , c^6 , c^7 , c^8 and c^9 , as well as to the relays d , d' , d^2 , d^3 , d^4 , d^5 , d^6 , d^7 , d^8 and d^9 inclusive and the wire 85 is also shown connected to the relay e . The relays c to c^9 inclusive are connected by the
70 wire 95 to the relay f embracing a signal light or indicator designated by the numeral within the circle. The relays d to d^9 are connected by the wire 96 to the relay g embracing a signal light or indicator designated by the numeral
75 within the circle and the relay e is shown con-

nected by the wire 97 to the relay h including a signal light or indicator designated by the numeral within the circle. At 98 we have shown a battery through which a circuit is completed back to the relays c to c^9 inclusive, d to d^9 inclusive
5 and e the wire 99 leading from the battery and connected by branch wires, as shown, to the respective relays. The signal lights or indicators embraced within the relay f , g and h are what may be termed the "hundred" indicators or
10 signals.

The numerals 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220, 230, 240, 250, 260, 270, 280, 290 and 300 designate the yardage or area
15 covered by each group of contact wires but it will be understood, as previously stated, that we have only illustrated a connection between the 100 to 109 yard area, the 110 to 119 yard area and a portion of the 200 to 209 yard area.

From the above detailed description it is
20 thought that the arrangement of the parts in Fig. 5 of the drawings will be clearly understood and we will now endeavor to give an illustration of the manner of operation. If a ball or other
25 object in flight, either driven or thrown, engages with the first pair of wires 50 and 51 in the group 47, which in reality are illustrative of a set of thirty-six wires covering a yard area, a circuit will be closed and current will flow through
30 the wire 50 to the wire 70 which leads to the relay a to operate the units signal within that relay and through the breaker b. Current from the wire 51 passes to the wire 80 and from the wire 80 to the relay c for operating the relay
35 and back through the connection to the wire 85 which leads to the relay a^{10} for operating the tens signal. The operation of the relay c causes the current to flow through the wire 95 to the relay f for operating the hundreds signal within
40 the relay and from the relay f the current passes back through battery 99 and wire 99 to relay c . Thus with this operation, the engagement of the first pair of wires 50 and 51 of the group 47 operates the signals to indicate 100 yards. If the
45 second pair of wires 52 and 53 is engaged to close the circuit the signals will be operated to indicate 101 yards. In this operation current passes through the wire 52 of the second pair to the wire 71 which is connected to the relay a' and
50 operates the units signal or indicator 1. The current also passes through the breaker b. The current from the wire 53 of the second pair passes through the wire 80 to the relay c to operate this relay and then passes back to the wire 85 to operate the relay a^{10} and the "0" indicator controlled by that relay, the operation
55 of the relay c causes current to pass through the wire 95 to the relay f and operate the 1 signal or indicator controlled thereby. Thus in this operation 101 yards is indicated. If the first pair of wires 50 and 51 of the group 48 are engaged to close the circuit the current will pass through the wire 50 to the wire 70 to operate
60 the relay a which in turn operates the 0 of the units indicator and passes through the breaker b. Current from the wire 51 of this group connects with the wire 81 and as the current passes through the wire 81 it operates the relay c' and returns to the wire 86 which operates the relay a^{11} which controls the 1 indicator or signal of the tens
70 unit. The operation of the relay c causes the current to pass through the wire 95 to the relay f and operate the 1 signal or indicator of the hundreds. Thus there will be an indication of 110 yards. Now passing to the group 49. If the
75

wires 50 and 51 of the first pair are engaged the circuit will be closed and current passes through the wire 50 to the wire 70 which connects and operates the relay *a* which controls the 0 or unit signal. Current from the wire 51 passes through the wire 82 to the breaker *d* which is operated and then returns to the wire 85 which connects and operates the relay *a*¹⁰ controlling the 0 of the tens. The operation of the relay *d* causes current to pass through the wire 96 to the relay *g* which operates the 2 signal or indicator forming the hundreds. In this operation 200 yards will be indicated. While we have described only a few of the operations it will be understood that the various signals or indicators are operated according to the wires 50 and 51 contacted. Each pair of wires, as previously stated, indicates a yard and runs successively, in the showing illustrated, from 100 yards to such distance as may be desired.

While we have illustrated the signals or indicators in the form of electric lights we wish it understood that we are not limited to this particular form but any form of indicator or signal may be used such as a drop or numerals on a translucent plate within a casing behind which is placed a light. At the same time while we have referred to the indicator as being operated by a ball or similar missile it will be understood that it could equally as well be operated by any missile in flight such as a bullet or the like and while we have shown the contact wires as arranged horizontally over a predetermined area such wires might be arranged vertically for use as a target.

Having fully described our invention what we claim as new and desire to secure by Letters Patent is:

1. An apparatus of the character described for indicating the distance that an object is driven in flight including a zone comprising a plurality of closely related movable strands supported and positioned over and in spaced relation to the ground at accurate distances from the point that impact is given to the object to cause its flight, an indicator, and means operable by vibration of the strands of the zone by contact of the object for operating the indicator, the strands of the zone being closely related preventing the object whose flight distance is to be measured from

passing therebetween without vibrating at least one of the strands.

2. An apparatus of the character described for indicating the distance that an object is driven in flight including a zone comprising a plurality of closely related movable strands supported and positioned over and in spaced relation to the ground at accurate distances from the point that impact is given to the object to cause its flight, an indicator, and electrical means operable by vibration of the strands of the zone by contact of the object for operating the indicator, the strands of the zone being closely related preventing the object whose flight distance is to be measured from passing therebetween without vibrating at least one of the strands.

3. An apparatus of the character described for indicating the distance that an object is driven in flight including a zone comprising a plurality of closely related movable strands supported and positioned over and in spaced relation to the ground at accurate distances from the point that impact is given to the object to cause its flight, an indicator, means operable by vibration of the strands of the zone by contact of the object for operating the indicator, the strands of the zone being closely related preventing the object whose flight distance is to be measured from passing therebetween without vibrating at least one of the strands, and means bodily carried by the strands for stopping excessive vibration thereof.

4. An apparatus of the character described for indicating the distance that an object is driven in flight including a zone comprising a plurality of closely related movable strands supported and positioned over and in spaced relation to the ground at accurate distances from the point that impact is given to the object to cause its flight, an indicator, means operable by vibration of the strands of the zone by contact of the object for operating the indicator, the strands of the zone being closely related preventing the object whose flight distance is to be measured from passing therebetween without vibrating at least one of the strands, and a member extending transversely of and bodily carried by the strands for stopping excessive vibration thereof.

JACKSON H. PENCE.
MILES E. BAILEY.