

Dec. 15, 1936.

G. A. HARRISON

2,064,603

AUDIBLE SIGNAL DEVICE

Original Filed Feb. 2, 1932

2 Sheets-Sheet 1

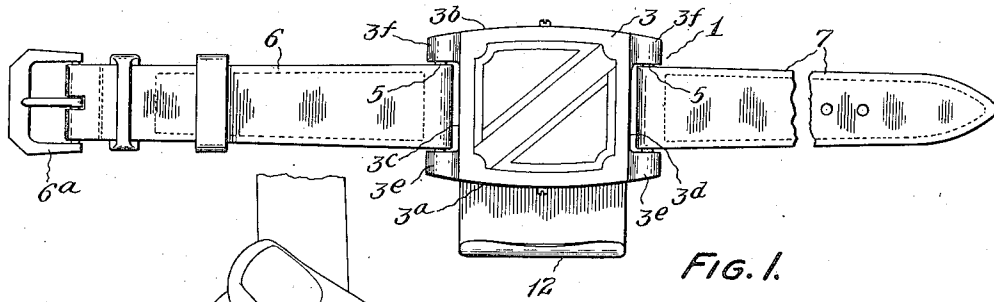


FIG. 1.

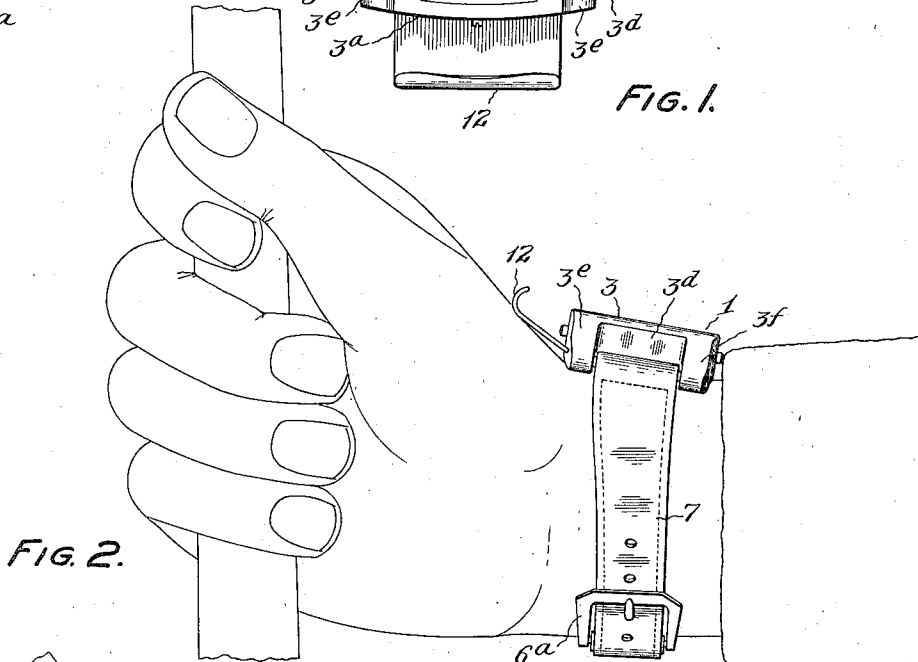


FIG. 2.

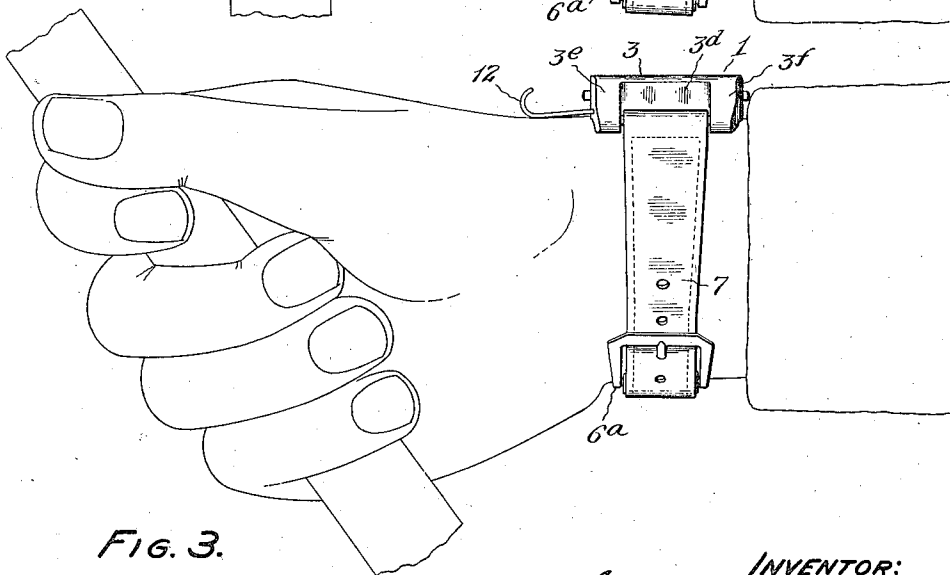


FIG. 3.

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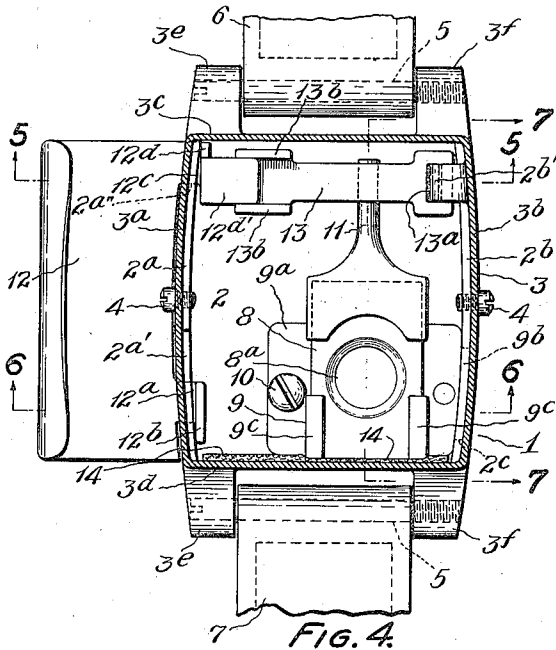


FIG. 4.

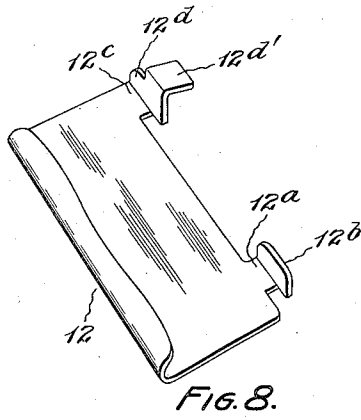


FIG. 8.

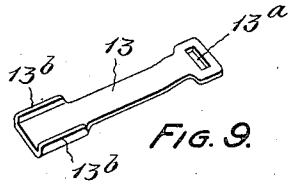


FIG. 9.

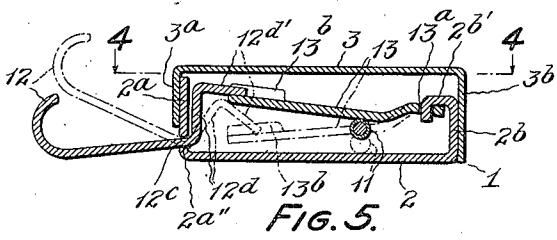


FIG. 5.

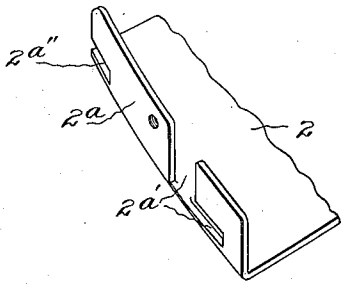


FIG. 10.

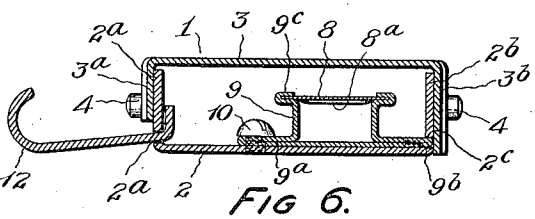


FIG. 6.

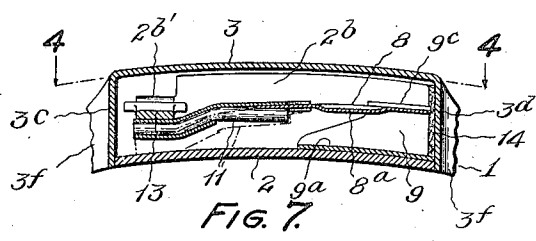


FIG. 7.

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# UNITED STATES PATENT OFFICE

2,064,603

## AUDIBLE SIGNAL DEVICE

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Application February 2, 1932, Serial No. 590,433  
Renewed August 6, 1936

10 Claims. (Cl. 35—29)

The invention relates to a device designed to indicate the occurrence of predetermined physical movements of a person using the device in connection with the practice or playing of games, musical instruments, etc.

In the playing of various games, such, for example, as golf, tennis and billiards, the timing of certain movements of the player is quite important and essential to the attainment of a satisfactory form of technique. Thus, in the game of golf the wrist movement of the player near the end of the back swing of the driving stroke and the reverse wrist movement during the forward swing, are generally considered vitally important; and there are analogous movements in the playing of tennis, billiards and other games. Similarly, in the playing of the violin the bowing movements of the player involve wrist movements which are vitally important, and there are analogous important movements in the playing of other instruments. Usually, as in the examples mentioned, the wrist movements are combined with full arm movements of the player and it is difficult for the player to concentrate his attention upon any part of the combined movement without disastrous effects upon the movement as a whole.

Accordingly, the general object of the present invention is to provide a signal device which can be worn by the player and which, by automatically giving an audible signal of the occurrence of a particular movement, such as a wrist movement, will enable the player to check a particular part of a combined or compound movement without mental concentration upon that particular part of the movement.

Another object of the invention is to provide a signal device of the character referred to which is adapted to be worn on the wrist of the person using it and to give an audible signal of the occurrence of wrist movements in two opposite directions, as in the case of the "cocking" and "uncocking" of the wrist during the back and forward swings, respectively, of a golf club in driving.

A further object of the invention is to provide a signal device of the character referred to which is light in weight and compact so that it can be worn conveniently by the user.

Other objects of the invention comprise the production of a device of the character referred to that is simply constructed, reliable in operation and susceptible of manufacture at moderate cost.

Other objects more or less incidental or ancillary to those above mentioned will be apparent

from the following detailed description of a preferred embodiment of the invention.

While my invention in its broader aspects may take a great variety of forms and is adapted for many and varied uses, I have chosen, for the purposes of explanation and illustration, to show it as adapted to be worn upon the wrist in the practice and playing of golf.

In the accompanying drawings forming a part of this specification, Fig. 1 is a plan view of an indicator embodying my improvements.

Fig. 2 is a view showing the indicator as worn on the right wrist of a golf player for the driving stroke, the wrist being in the cocked position as at the top of the back swing of the stroke.

Fig. 3 is a similar view showing the parts of the indicator in the positions occupied when the wrist of the player is uncocked.

Fig. 4 is an enlarged sectional plan view of the indicator proper, the section being taken on the lines 4—4 of Figs. 5 and 7.

Fig. 5 is a section on the line 5—5 of Fig. 4.

Fig. 6 is a section on the line 6—6 of Fig. 4.

Fig. 7 is a section on the line 7—7 of Fig. 4.

Fig. 8 is a detailed perspective view of the main signal-actuating member of the device.

Fig. 9 is a perspective detailed view of the intermediate signal-actuating lever.

Fig. 10 is a fragmentary detailed perspective view of a portion of the casing structure of the device.

Referring in detail to the construction illustrated, the signal device comprises a casing structure designated in its entirety by the numeral 1, said structure being comparable in form and dimensions to a man's wrist watch. The casing comprises a bottom wall section 2 (see Fig. 5) having on two opposite sides upturned walls or flanges 2<sup>a</sup> and 2<sup>b</sup>, and a top wall section 3 which is also formed with depending side wall sections 3<sup>a</sup> and 3<sup>b</sup> and end wall sections 3<sup>c</sup> and 3<sup>d</sup> which fit over the side wall parts or flanges and under edges of the bottom wall section 2. The two casing parts 2 and 3 are secured together in assembled relation by screws 4, 4.

The end walls 3<sup>c</sup> and 3<sup>d</sup> of the casing member 3 are each formed with lugs 3<sup>e</sup> and 3<sup>f</sup> to receive pins 5, 5 to which wrist straps 6 and 7 are secured, the strap 6 being fitted with a suitable buckle 6<sup>a</sup> with which the strap 7 cooperates to secure the device to the wrist of the wearer. The pins 5 are screw slotted at one end and threaded at the other end to engage corresponding threads in the lugs 3<sup>f</sup> so that said pins can readily be

removed when it is desired to renew the wrist straps (see Fig. 4).

Within the casing of the device is arranged an audible signal member 8 in the form of a thin plate of spring steel in which a circular depression 8<sup>a</sup> has been pressed to locally distort or strain the member. The signal member 8 is carried by a support 9 which has a flanged base 9<sup>a</sup> rigidly secured to the bottom casing member 2 by means of a tongue 9<sup>b</sup> which projects into a slot 2<sup>c</sup> in the casing member 2 and a screw 10 which secures the opposite side of the flanged base 9<sup>a</sup> to the bottom wall of the case. The signal member 8 is secured to the support 9 by flanges 9<sup>c</sup>, 9<sup>c</sup> thereof (see Figs. 4 and 6) which grip and rigidly hold the opposite edges of the member 8 adjacent one end thereof. A finger like extension 11 is rigidly secured to the other end of the signal member 8.

With the signal member 8 thus supported, if it is flexed by depressing the finger extension 11 it acts, at a certain point in the bending movement, to emit a snapping sound which is loud enough to be easily heard by a person wearing the device and which is due to the strained or distorted form of the member 8, as is readily understood, this being a well known form of sound-emitting or signalling device. If the pressure be removed from the finger extension 11 the elastic quality of the member 8 causes it to return to its straight or normal form and during this return movement the member 8 emits a second snapping sound. However, this second snapping sound occurs at a point in the return movement nearer the normal position of the member 8 than does the snapping sound or signal which occurs during the depression or flexing of said member.

To effect a suitable movement of the signal member 8 to produce audible signals for the guidance of the wearer the device is fitted with an actuating plate or lever 12 which is movably connected to the casing 1 and projects therefrom so as to engage the back of the thumb of the wearer as shown in Figs. 2 and 3. The member 12 is formed on one side with a tongue 12<sup>a</sup> having an upstanding flange 12<sup>b</sup> and also with a tongue 12<sup>c</sup> having an upstanding flange 12<sup>d</sup> which is formed with a lever extension 12<sup>d'</sup>. Correspondingly, the side wall 2<sup>a</sup> of the casing member 2 is formed with a bayonet slot 2<sup>a'</sup> and with a horizontal slot 2<sup>a''</sup>. The actuating lever 12 and casing member 2 are assembled by inserting the tongue 12<sup>a</sup> into the upright portion of the bayonet slot 2<sup>a</sup> and then moving the member 12 laterally in relation to the member 2 so as to bring the tongue 12<sup>a</sup> into the horizontal section of the slot 2<sup>a'</sup> and the tongue 12<sup>c</sup> into the slot 2<sup>a''</sup>, thus disposing the flanges 12<sup>b</sup> and 12<sup>d</sup> on the inner side of the wall 2<sup>a</sup>.

13 is a second lever member arranged to engage the finger extension 11 of the signal device. The lever 13 has a fulcrum engagement at one end with a leg 2<sup>b'</sup> formed on the wall 2<sup>b</sup>, the lever being formed with a hole 13<sup>a</sup> to receive the end of said leg so that the lever is secured against lateral displacement. The lever 13 is disposed so as to be engaged at its other end by means of the lever extension 12<sup>d'</sup> of the actuating lever 12 and the lever 13 is formed with flanges 13<sup>b</sup> to engage the sides of the extension 12<sup>d'</sup> and hold the two lever members in operative engagement.

It will be seen that in assembling the device all of the working parts are assembled on the bottom wall section 2 of the casing structure.

When they are thus assembled the top wall section 3 is applied to the bottom wall section and when this is done the end wall of the section 3, by engaging the part 12<sup>d</sup> of the actuating lever (see Fig. 4), serves to prevent lateral displacement of the lever 12, and as long as it is secured in operative position the resilient upward pressure of the finger extension 11 on the under side of the lever 13 serves to hold the latter in operative engagement with its fulcrum and the lever extension 12<sup>d'</sup> of the actuating member 12.

A strip 14 of soft leather is preferably interposed between the end of the signal support 9 and the adjacent end wall of the casing member 3, as I have found that this makes the audible signal clearer and stronger.

From the foregoing description the use and operation of the device will be understood with but little further explanation. Assuming the device is to be used in the practice or playing of golf, and that the player has strapped the device to his wrist as indicated in Figs. 2 and 3 for practice of the driving stroke, as the player about to drive addresses the ball the wrist of the right arm is straight, substantially as shown in Fig. 3. On the back swing, if the player keeps the left elbow straight or nearly so, the wrist of his right arm should come into a laterally bent or cocked position, as shown in Fig. 2, at the end of the back swing so as to bring the shaft of the club over his right shoulder. This cocking of the wrist at the top of the back swing causes the back of the player's right thumb to press upon the actuating lever 12 of the signal device and move it from the position shown in Fig. 3 to that shown in Fig. 2. This movement of the lever 12 in turn causes depression of the lever 13 and the finger extension 11 of the signal member 8. Near the end of this movement of the parts the signal member 8 passes its critical position and emits its characteristic snapping sound, thus audibly indicating to the player that he has achieved the proper wrist action in the back swing. On the forward swing of the club the right wrist of the player is straightened, thus permitting the resilient force of the signal member 8 to return the latter, and also the actuating levers 12 and 13, to their normal positions, and during this return and at a point near the end thereof, the member 8 again passes its critical position and again emits its characteristic snapping sound, thus indicating to the player the point in his swing at which his wrist becomes substantially straight or uncocked.

The timing of the audible signal in relation to the movement of the main actuating lever 12 can be varied by slightly varying the form of the lever 13. As a practical matter this can be accomplished either by providing two or more interchangeable levers 13 so that the individual user of the device can select the particular form of lever 13 that best suits his requirements, or the user can, by slightly bending the lever 13, readily accomplish the same end. Ordinarily, however, a single standard form of construction, if properly designed, will be found to meet the needs of the great majority of users.

It will readily be understood that my improved signal device can be secured to the wrist in various positions and that it can be worn upon either the right or the left wrist of the user. For example it can be secured to the left wrist of the user in a position such that the signal-actuating lever 12 will engage what is, in Figs. 2 and 3, the under side of the hand and thus serve to

indicate the extreme uncocking action or position of the left hand as the driving swing is carried through following impact of the club and ball. Again, the device can be worn upon either wrist in a position such that the actuating lever 12 will engage the middle part of the back of the hand, and thus worn the device serves as a check upon wrist action in the putting stroke. Various other applications of the device will be apparent to anyone using it.

The advantages to be derived from the use of my improved signal device or wrist indicator will be apparent to golf players and particularly to teachers of the game. With the device worn on the right wrist, the audible signal given at or near the end of the back stroke in driving when the right wrist is properly cocked serves to indicate to the player whether or not he is keeping his left arm straight, since the right wrist will not be fully cocked if the left elbow is bent. This audible signal at the top of the back stroke also makes it easier for the player to achieve a deliberate back swing and a momentary pause at the top of the swing, the desirability of which is well understood. On the forward swing from the top of the back stroke, the audible signal which is given as the wrist is returned to its straight or uncocked position enables the player to readily check the point in the swing at which he straightens his right wrist. Thus the player is greatly helped in overcoming the common fault of straightening the wrists too early in the forward swing, instead of waiting until a later point in the swing so that the straightening of the wrists snaps the head of the club forward at high velocity at the time of impact with the ball.

Similar or analogous advantages are secured from the use of the signal when it is worn in the various other ways above indicated, as will be apparent without further discussion.

As is well understood by golf players, the movements of the player in swinging the golf club are relatively complex, involving movements of legs, hips, shoulders, arms and wrists. Smoothness and rhythm in executing these combined movements are essential to successful play and it is difficult to secure such smoothness and rhythm if there is marked mental concentration by the player upon any one element of the combined movement. My improved audible signal has the notable advantage that its operation is wholly automatic and requires no special attention on the part of the player and yet the clear audible signal gives the player a check upon his wrist action without any particular mental concentration on that feature of his swing and consequently the smoothness and rhythm of his swing is not destroyed or interfered with.

From the foregoing description it will be obvious that my improved signal or indicator can be used to advantage in the practice or play of various other games, such as tennis and billiards, where wrist action plays an important part. Also in the practice and playing of various musical instruments, such as the violin, my wrist indicator can be used very advantageously. In fact it can be used to advantage in any practice or play where the timing of physical movements of the player is important. It is obvious that the device is not limited to the indication of wrist movements but, by suitable obvious modifications, can be applied to the relative movements of different parts of the player's body where relative movement occurs.

The parts of the signal device illustrated can,

for the most part, be pressed or stamped from sheet metal and can be assembled easily and rapidly, so that the device is susceptible of production at moderate cost. The parts of the device can be made of a variety of suitable metals, or other materials, as will be understood. The top casing part, in particular, can be made of different metals and other materials and varied as to form and ornamentation as desired.

While the specific construction of the device illustrated is such as I have found preferable, it will be understood that it can in all respects be varied widely within the scope of my invention, which is defined in the appended claims.

What I claim is:

1. In a device for indicating the physical movements of a person wearing the device, the combination of audible signal means; means for securing said signal means on one part of the wearer's person; and means operatively connected to the signal and securing means and adapted to be engaged and moved by another part of the wearer's person to actuate the signal means and thereby indicate the occurrence of a particular relative movement of the two said parts of the wearer's person.

2. In a device for indicating physical movements of a person wearing the device, the combination of audible signal means; a support therefor adapted to be secured to one part of the wearer's person; and means movably connected to the support and adapted to be engaged and moved by another part of the wearer's person to actuate the signal means and thereby indicate the occurrence of a particular relative movement of the two said parts of the wearer's person.

3. In a device for indicating physical movements of a person wearing the device, the combination of audible signal means; a support therefor adapted to be secured to one part of the wearer's person; and means movably connected to the support and adapted to be engaged and moved by another part of the wearer's person to actuate the signal means, the signal means, support and movable means being so constructed and arranged that the signal means is actuated to give audible signals indicating certain relative positions of the two said parts of the wearer's person when said parts are relatively moved in opposite directions.

4. In a device for indicating physical movements of a person wearing the device, the combination of audible signal means; a support therefor adapted to be secured to one part of the wearer's person; and means movably connected to the support and adapted to be engaged and moved by another part of the wearer's person to actuate the signal means, the signal means, support and movable means being so constructed and arranged that when the two said parts of the wearer's person are moved relatively in opposite directions the signal is actuated at one point in the movement in one direction and at another point in the reverse movement.

5. In a device for indicating physical movements of a person wearing the device, the combination of audible signal means; a support therefor adapted to be secured to a limb of the wearer adjacent a joint; and means movably connected to the support and adapted to be engaged by the said limb of the wearer and moved by the wearer's movement at said joint to actuate the signal means at a certain point in the movement.

6. In a device for indicating wrist movements of a person wearing the device, the combination

- of a casing structure; means for securing the said structure on the wrist of a wearer; an audible signal device enclosed in the casing; and means for actuating the signal device comprising a
- 5 member movably connected to the casing structure and arranged to be engaged by the hand of the wearer, whereby when the wrist is bent the said means is moved and caused to actuate the signal device.
- 10 7. In a device for indicating wrist movements of a person wearing the device, the combination of a casing structure; means for securing the said structure on the wrist of a wearer; an audible signal device enclosed in the casing and comprising
- 15 a flexible resilient member formed with a local strain and adapted both when flexed from its normal form and when resuming its normal form after such flexing to emit an audible snapping sound; and means for flexing the resilient signal
- 20 member comprising a member movably connected to the casing and extending therefrom to be engaged and moved by the hand of the wearer when the wrist is flexed.
- 25 8. A device of the character described, comprising a signal, means for attaching the signal to the arm of a player, means for actuating the

signal, and means connected to the actuating means for operating the latter in response to bending and unbending of the wrists to effect operation of the signal.

9. A device of the character described, comprising a support adapted to be secured to one part of a wearer's person; actuating means connected to said support and relatively movable with respect thereto, and adapted to be operated by movement of another part of the wearer's person; and audible signal means carried by said device and actuatable through relative movements of said actuating means with respect to said support, to indicate the occurrence of a particular relative movement of the two said parts of the wearer's

5 10 15

10. A device of the character described, comprising a signal means adapted to be secured to one part of a wearer's person; and means actuatable by movement of another part of the wearer's person, and movable with reference to said first part, for actuating said signal means to indicate the occurrence of a particular relative movement of the two said parts of the wearer's person.

20 25

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