O. E. KELLUM.

SOUND TRANSMISSION AND RECORDING.

APPLICATION FILED SEPT. 13, 1913. RENEWED MAR. 18, 1915.

1,137,060.

Patented Apr. 27, 1915.

2 SHEETS—SHEET 1.

Fig. 1

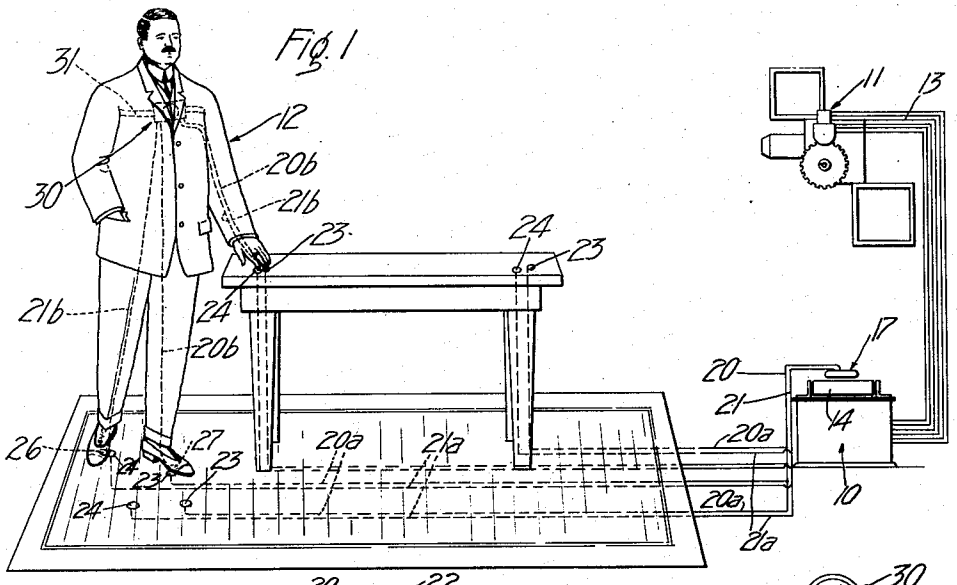


Fig. 2

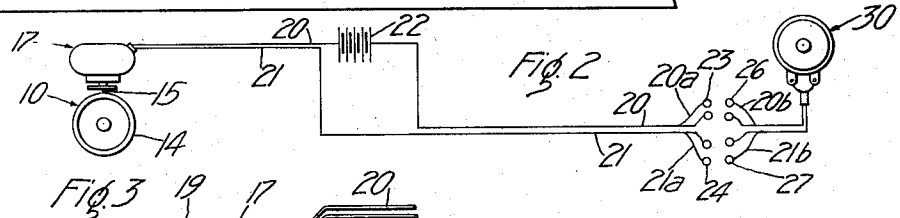


Fig. 3

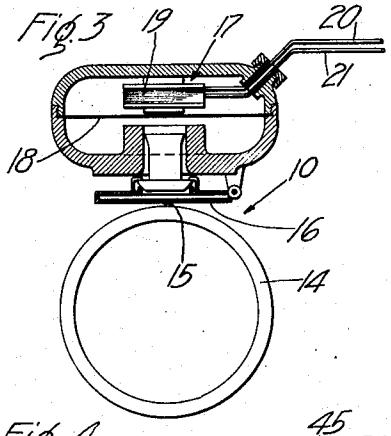


Fig. 5

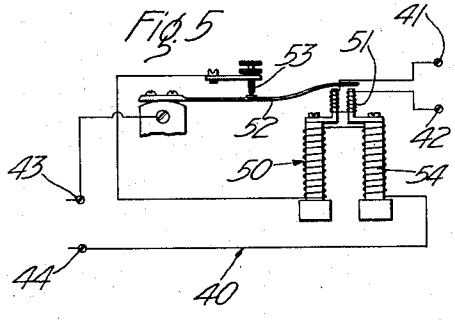
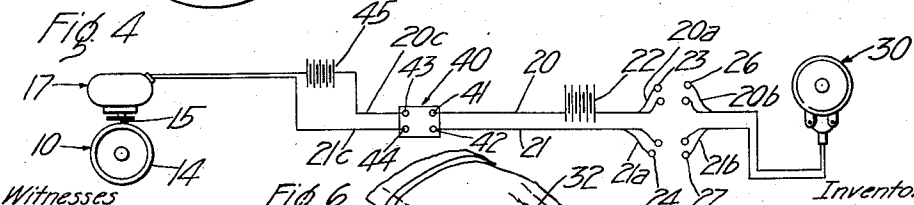


Fig. 4



Witnesses

L. Hoffman.

Fig. 6



Inventor

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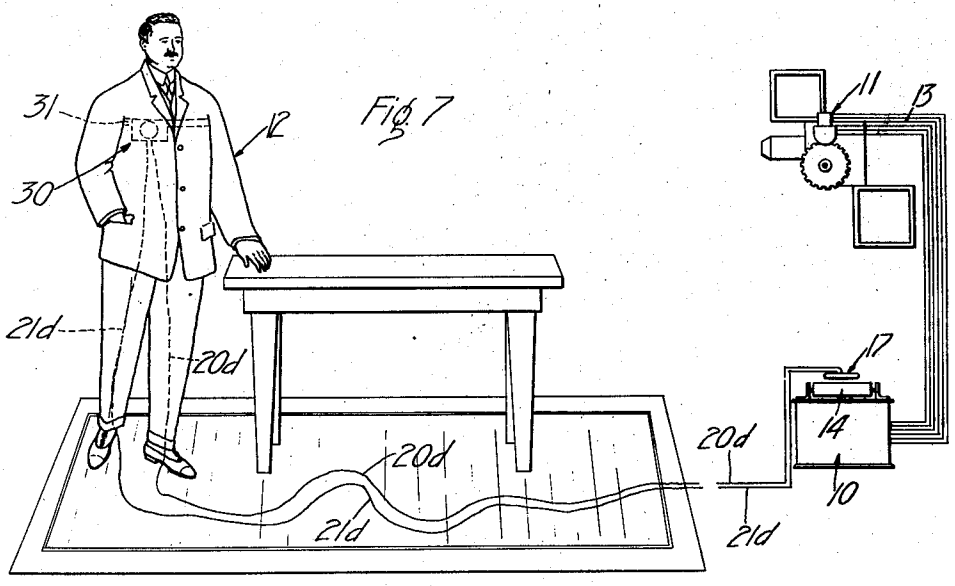


Fig 7

Witnesses

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UNITED STATES PATENT OFFICE.

ORLANDO E. KELLUM, OF LOS ANGELES, CALIFORNIA.

SOUND TRANSMISSION AND RECORDING.

1,137,060. Specification of Letters Patent. Patented Apr. 27, 1915.

Application filed September 13, 1913, Serial No. 789,643. Renewed March 18, 1915. Serial No. 15,386.

To all whom it may concern:

Be it known that I, ORLANDO E. KELLUM, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles, State of California, have invented new and useful Improvements in Sound Transmission and Recording, of which the following is a specification.

This invention relates to a device for transmitting and recording sound, especially in making sound records for use in talking moving pictures; and the invention consists in the novel features of the sound transmitting and recording device and broadly in the combination of such device with a synchronously operating moving picture camera; the prime object of the invention being the easy and efficient production of synchronous sound and visual records which may be subsequently synchronously reproduced in proper correspondence to each other.

In its now preferred form, my invention includes a sound recorder and electrical transmission apparatus; said transmission apparatus including a telephonic transmitter or the like placed upon a person, a telephonic receiver or the like coöperating with the sound recorder, and electrical connections between the transmitter and receiver of such nature as to allow the person to move within the field of view of the motion picture camera and to be audibly in connection with the sound recorder. These connections may be made in a variety of manners so as to be invisible or practically invisible to the motion picture camera. I prefer to use contacts mounted upon the person and contacts which are stationarily distributed about the field of view. The stationary contacts may be distributed so as to be easily engaged by the contacts mounted upon the person while the person assumes natural poses at will; the contacts either being in the floor or on the various furniture in the vicinity, or both. Another means which I may use will include a fine wire connection directly from the person to the recorder, or the electrically actuated apparatus thereof, said wires being of a size and color to not be discernible in the motion picture.

I have shown preferred forms of my apparatus in the accompanying drawings, in which,

Figure 1 is a view partly in perspective and partly in diagram showing my complete arrangement in its preferred form, Fig. 2 is a diagram showing the electrical arrangements thereof, Fig. 3 is a view showing a possible construction of the sound recording apparatus, Fig. 4 is a diagram illustrating a modified form of apparatus with a telephonic relay included therein, Fig. 5 is a diagram showing such a telephonic relay as I may use, Fig. 6 is a detail showing a method of mounting a contact upon the person, and Fig. 7 is a view similar to Fig. 1 showing the connections made from the person to the sound recorder by direct wiring.

In the drawings the numeral 10 designates a sound recording apparatus, 11 a moving picture camera and 12 a person whose actions and speech it is desired to record. The moving picture camera 11 and the sound recorder 10 are operated synchronously, being connected by means of wires 13 so that they operate together. This species of synchronous coöperation may be the same as shown in my Patent No. 1,027,658 dated May 28th, 1912. In the preferred form of my synchronous operating mechanism the moving picture camera is operated from the sound recorder, any usual means being utilized to primarily operate the sound recorder.

The sound recorder 10 may be of any desired type. For convenience of illustration, I have shown a cylindrical recording machine, carrying the cylindrical record 14, the recording stylus 15, the diaphragm 16, and a means 17 for electrically transmitting to the diaphragm the sound vibrations which are originally produced by the speech of a person and which are ultimately recorded upon the record 14. The device 17 may be of any desired character, and may coöperate with the recording stylus 15 in any manner. As a simple arrangement, I have shown a telephonic receiver apparatus having a diaphragm 18 and electromagnet 19, the magnetically caused vibrations of the diaphragm producing sound waves which impinge upon the stylus diaphragm 16; or the arrangement may be made to combine diaphragms 16 and 18 into a single diaphragm. The arrangement illustrated has the advantage of taking the weight of the telephonic receiver apparatus off the stylus.

Wires 20 and 21 connect to the receiver, and the wires may include in circuit, as is

shown in Fig. 2, a battery 22. From wires 20 and 21 branch wires 20^a and 21^a lead to various contacts 23 and 24, which may be distributed about the space in which the person is moving. These contacts 23 and 24 may be placed on the floor or furniture and the wires 20^a and 21^a may pass beneath the carpet or rug or may be concealed in other manners; or they may be of such color and of so small diameter as to be invisible or practically invisible in the final motion picture. The contacts 23 and 24 may be made small so as to be unnoticeable, or may be built into the various furniture in such manner as to apparently form parts thereof. It is only necessary that one of contacts 23 and one of contacts 24 be connected with in order to establish a complete circuit; and these contacts may be engaged by finger contacts or foot contacts on the person, or by both.

The personal equipment of my device consists preferably in a suitable telephonic transmitter 30 which is placed in any suitable position on the person, as for instance being placed against the person's chest and either held in position by a suitable belt 31 or by mere pressure of the clothing. Various wires 20^b and 21^b may proceed from the opposite sides of the telephonic transmitter and may terminate in suitable contacts 26 and 27 which may be mounted in convenient positions on the person. As indicated, the contacts may be mounted either on the hand or on the foot; and in Fig. 6 I have shown in detail the mounting of a hand contact. In this figure, the contact may consist of a thin flexible contact strip 31 mounted upon a finger ring of ordinary appearance, the contact strip being on the inside of the finger where it is not noticeable and where it may be easily engaged with the stationary contacts. As hereinbefore stated, it is only necessary that one set of contacts on each side of the circuit be in engagement. Thus, the circuit may run through one set of contacts including a finger contact and through another set of contacts including a foot contact.

If necessary, in order to produce good results in the recorder 19, I may use a telephonic relay 40 of any preferred nature, a practicable form being shown in Fig. 5. This telephonic relay has the effect of greatly increasing the amplitude of the electrical waves, so that greatly increased results may be had at the sound recorder. In this telephonic relay the wires 20 and 21 from the transmitter 30 will lead to binding posts 41 and 42, and the wires 20^c and 21^c leading to the recording apparatus will lead from binding posts 43 and 44. The battery 22 is used as in the device of Fig. 2, while auxiliary battery 45 is used on the recorder side of the relay. The relay consists essentially in a double wound magnet 50 having a winding 51 connected directly to the binding posts 41 and 42. This double wound magnet vibrates a vibrating armature 52 which coöperates with adjustable contact 53, the variations in the secondary current of the relay being made by variations of resistance at the contact 53. The winding 54 of the magnet 50 is in series with the contact 53; and this series circuit connects directly to the binding posts 43 and 44. This form of relay is well known to the art; I may use this form or any equivalent form.

In Fig. 7 I have shown an arrangement practically the same as that shown in Fig. 1, in which I eliminate the contacts 23, 24, 26 and 27 and connect the transmitter 30 on the person directly with the recording apparatus by means of fine wires 20^d and 21^d. These wires may be passed through the clothing of the person to the floor and may then lie loosely on the floor and connect with the sound recorder. They may be of such color and such diameters as to be invisible or practically invisible in the ultimate moving picture.

I claim—

1. In combination, a sound recording apparatus, a telephonic receiver apparatus cooperating therewith, a telephonic transmitter apparatus adapted to be placed upon a person, and an electric circuit between the transmitter and receiver apparatus including electrical contacts mounted upon the person and adapted to be brought into contact with stationary electrical contacts also in the circuit.

2. In combination, an electrically actuated sound recording mechanism, a telephonic transmitter adapted to be placed upon a person, and an electrical circuit between the transmitter and the sound recording mechanism including contacts mounted upon the person and coöperating stationary contacts adapted to be engaged by the contacts upon the person.

3. In combination, a moving picture camera and a sound recording mechanism operating together in synchronism, electrically actuated means for conveying sound vibrations to the sound recorder, a telephonic transmitter adapted to be placed upon a person, and an electrical circuit between the transmitter and the sound vibration conveying means including circuit connections permitting movement of the person relative to the recorder within the field of view of the camera.

4. In combination, a moving picture camera and a sound recording mechanism operating together in synchronism, electrically actuated means for conveying sound vibrations to the sound recorder, a telephonic transmitter adapted to be placed upon a

person, and an electrical circuit between the transmitter and the sound vibration means including contacts mounted upon the person and stationary contacts adapted to be engaged by the contacts on the person, said stationary contacts being arranged so that they may be engaged when the person is in the field of view of said camera.

5. In combination, a moving picture camera and a sound recording mechanism operating together in synchronism, a telephonic receiver in coöperation with the sound recorder, a telephonic transmitter adapted to be placed upon a person, and an electrical circuit between the transmitter and receiver including contacts mounted upon the person and stationary contacts adapted to be engaged by the contacts upon the person, said stationary contacts being arranged so that they may be engaged when the person is in the field of view of said camera.

6. In combination, a sound recording apparatus, a telephonic receiver apparatus cooperating therewith, a telephonic transmitter apparatus adapted to be placed upon a person, and an electric circuit between the transmitter and receiver apparatus including a pair of contacts mounted upon the person and including a plurality of pairs of stationary contacts placed at different points, engagement of the pair of personal contacts with any of the pairs of stationary contacts completing said electrical circuit.

7. In combination, an electrically actuated sound recording mechanism, a telephonic transmitter adapted to be placed upon a person, and an electrical circuit between the transmitter and the sound recording mechanism including a pair of contacts mounted upon the person and including a plurality of pairs of stationary contacts placed at different points, engagement of the pair of personal contacts with any of the pairs of stationary contacts completing said electrical circuit.

8. In combination, a moving picture camera and a sound recording mechanism operating together in synchronism, electrically actuated means for conveying sound vibrations to the sound recorder, a telephonic transmitter adapted to be placed upon a person, and an electrical circuit between the transmitter and the sound vibration means including a pair of contacts mounted upon the person and including a plurality of pairs of stationary contacts arranged in different positions within the field of view of the camera, engagement of the personal contacts with any pair of stationary contacts completing said circuit.

In witness that I claim the foregoing I have hereunto subscribed my name this 12th day of September 1913.

ORLANDO E. KELLUM.

Witnesses:
E. H. YOUNGMAN,
J. C. DUFFIELD.