

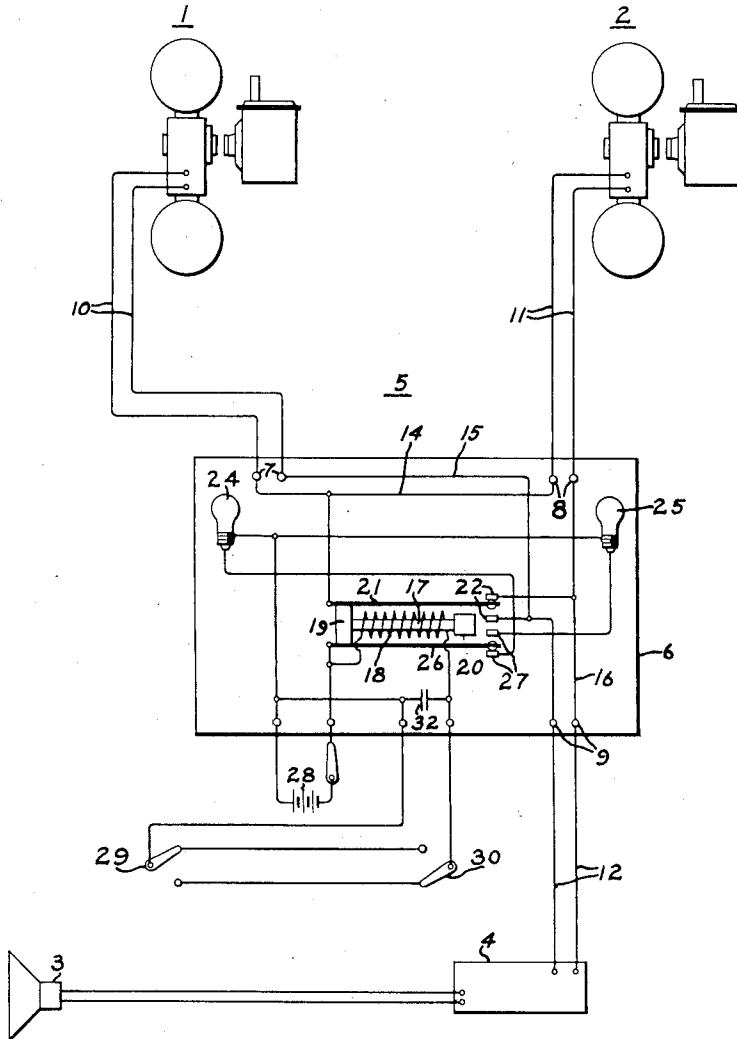
Feb. 5, 1935.

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1,990,388

CHANGEOVER DEVICE

Filed March 4, 1930



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UNITED STATES PATENT OFFICE

1,990,388

CHANGEOVER DEVICE

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Application March 4, 1930, Serial No. 433,165

1 Claim. (Cl. 179—100.3)

My invention relates to electrical apparatus including a plurality of signal producing devices and a signal responsive device which device is adapted selectively to be put into operative connection with any one of the signal producing devices. More particularly my invention relates to apparatus for making a sound record or for reproducing sound from a sound record electrically from any one of a plurality of devices which produce current impulses that vary in accordance with the sound waves.

In the case of apparatus for reproducing sound from film or disk records by electrical means it is often desirable to continue the sound reproduction without interruption from one film or disk to another. For this purpose two or more separate pick-up devices usually are employed so that when the end of one film or disk record is reached the connection to the sound producer may be transferred quickly to the pick-up cooperating with the next film or disk record. It is found that when such a transfer of the circuit connections is made by the use of an ordinary double pole switch very objectionable noises are produced by the sound producer at the instant of transfer. Also during reproduction from one record, noises and objectionable sounds foreign to the record, such as cross talk, often are heard which are traceable to one of the sound pick-up devices which is not at that time operatively connected through the switch to the sound producer. It is the object of my invention to provide improved apparatus of the above-mentioned character whereby the transfer from one signal source to another may be made with the resulting production of a minimum disturbance and in which during the use of one signal source objectionable signals may be prevented from coming from another signal source not at that time connected for service.

My invention will be better understood from the following description taken in connection with the accompanying drawing, and its scope will be pointed out in the appended claim.

The single figure of the drawing illustrates diagrammatically an embodiment of my invention wherein sound is adapted to be produced from either one of two devices for converting film sound records into electric vibrations. The two devices which I have illustrated in a conventional manner as the two combined film sound-picture projectors 1 and 2 each include in addition to picture projecting means a suitable and well known pick-up means for converting a photographic sound record on the picture film

into current vibrations which correspond with the recorded sound waves. The combined sound-picture machines 1 and 2 are merely shown by way of example, it being understood that the machines may comprise the sound pick-up means only; moreover, the sound record to be reproduced may be a phonograph record in the case of which a suitable and well known form of electrical pick-up would be employed. At 3 I have shown a sound producer, for example, a loud speaker of suitable and well known construction, and connected to the sound producer I have represented at 4 a suitable and well known amplifier which, for example, may be of the thermionic type. While I have made reference to but one amplifier 4, other amplifiers, transformers, etc., often are employed and arranged in close association with the pick-up devices, but for the sake of greater clearness in the drawing, the showing of such details has been purposely omitted as they form no part of my present invention.

Between the amplifier 4 and the projectors 1 and 2 is the switching device 5 now to be described by means of which the sound producer 3 is operatively connected with either one of the projectors 1 and 2. The switching device 5 has the supporting base or frame 6 upon which are mounted the various elements of the switch, the signal apparatus and the terminal connectors or binding posts 7, 8 and 9. To the latter are connected pairs of leads 10, 11 and 12 respectively from the projectors 1 and 2 and from the amplifier 4. Prior to my invention an ordinary two pole double throw switch had been used to connect the leads 12 with either leads 10 or 11. When such a switch is operated to transfer the received sound current, commonly termed the signal, from one projector to the other both sides of the circuit necessarily are opened and closed. This, by reason of the great amplification produced by the amplifier 4, results in an objectionable and loud noise from the sound producer. Disturbing noises are also often given out by the sound producer during the operation of one projector as a result of the work of the operator preparing the other projector for subsequent use. He may cause unintentional interruptions in the light beam of the sound pick-up of the other projector thereby giving rise to loud noises in the sound producer; a trial movement of the film in the other projector may also produce an annoying cross talk effect. Inasmuch as with the above described switching arrangement there is no direct connection between the circuit of the projector which at that time is not in service and the

amplifier, it is probable that the objectionable results mentioned above are due to a large extent, if not entirely, to electrostatic or capacity effects at the switch terminals.

5 According to the construction and arrangement which I have devised, the leads 10, 11 and 12 are connected in a series circuit and a switch is provided which enables the operator at will to short circuit either leads 10 or 11 according to which-
 10 ever projector is at the time out of service. Short circuiting the leads from a projector equalizes any and all potential differences that may exist between the leads due to noise or sound impulses coming from that projector. Referring again to
 15 the drawing, conductors 14, 15 and 16 serve to connect in a series circuit the binding posts 7, 8 and 9 of the switch. The structure of the switch, which in reality is a relay, comprises the core 17 having thereon the winding 18 and having the
 20 enlargement 19 at one end and the pole piece 20 at the other. The resilient switch blade 21 of magnetic material is rigidly secured at one end to the portion 19 and at the other end has contacts which are arranged to engage the fixed contacts
 25 22 connecting with the conductors 15 and 16. Blade 21 is connected to conductor 14. When the winding is deenergized the switch short circuits the leads from projector 2 and when energized short circuits the leads from projector 1.
 30 For the convenience of the operator, I have shown the two pilot lamps 24 and 25 for indicating which of the two projectors is at any time short circuited and have provided the switch with the additional switch blade 26 arranged to co-
 35 operate with the fixed contacts 27 in the lamp control circuit. The switch winding and pilot lamps are connected to be energized by the battery 28 for controlling the winding. I have shown the two hand operated switches 29 and 30 either
 40 of which may be used. The small condenser 32 serves to absorb any sparking impulse originating at these switches.

As a result of the construction and arrangement which I have shown and described the trans-

fer of the signal from one projector to the other is accomplished simply by removing the short circuit of the leads to one projector and applying a short circuit to the leads of the other projector. A minimum circuit disturbance is thereby set up in making the transfer and no disturbing noises or cross talk effects are heard during the operation of one projector which have their origin in the other projector.

Although I have illustrated my invention as including but two projectors it is not limited to two but is applicable to a system including any number of projectors, it being understood that the switch in any case will be constructed to open the short circuit only of the leads which connect with the particular projector to be used. As indicated above, my invention is applicable to recording apparatus in which the circuit connections to the film or disk recorder may be transferred from one sound pick-up to another.

I have chosen the particular embodiment described above as illustrative of my invention and it will be apparent that various modifications may be made without departing from the spirit and scope of my invention which modifications I aim to cover by the appended claim.

What I claim as new and desire to secure by Letters Patent of the United States, is:—

Apparatus for operatively connecting a sound reproducer with one or the other of two separate sound pick-up devices, comprising a base member having pairs of circuit terminals adapted for connection with the respective pick-up devices and sound reproducer, conductive means connecting said pairs of terminals in series, and a switch on said base member comprising a single movable contact member and cooperating front and rear contacts, said member and contacts having connections with said conductive means and arranged in one position of the member to apply a short circuit to one pair of pick-up terminals and in the other position to apply a short circuit to the other pair of pick-up terminals.

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