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PATENT



SPECIFICATION

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COMPLETE SPECIFICATION.

Improvements relating to the Combined use of Kinematographs and Talking Machines.

I, ERIC MAGNUS CAMPBELL TIGERSTEDT, of 4, Assmusen Allee, Copenhagen, Denmark, Engineer, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

5 This invention relates to an improved system or combination of a kinematograph with an apparatus for recording or reproducing sounds.

It has been proposed in photographing a scene to record at the same time sounds or conversations on a steel band secured to the film; and constituting a Poulsen telegraphonic record. With the proposed construction, in photographing

10 the images, the film can be driven only at a restricted velocity, so that with the steel band secured to the film the records would be situated too closely together and the magnetisations of the high strains or tones would partly coincide, so that neither the recording nor the reproducing of the sounds would be satisfactory. In order to obtain an excellent result it is necessary that the steel

15 band should be driven at a velocity exceeding that of the film thereby enabling the magnetisations of the steel band to be located at a sufficiently great distance from each other. It has also been proposed to use a combination of kinematograph film and an optical sound band for recording or reproducing sounds and to drive such band, at a faster speed than the kinematograph film.

20 The present invention consists in the employment in combination of a kinematograph film and a Poulsen sound band arranged to be operated at a higher velocity than the film band with the object of producing a more precise record and reproduction of the sounds. Other features of the invention will appear from the following description.

25 In the drawing the invention is diagrammatically illustrated by way of example.

Fig. 1 shows diagrammatically an apparatus for simultaneously photographing images and recording sounds.

30 Fig. 2 is an apparatus for simultaneously exhibiting images and reproducing sounds, conversations or the like.

Fig. 3 shows a detail.

The photographing of a scene is effected by a common kinematograph 1. By the operation of the film band 2 a roller 3 is positively turned with a peripheral

[Price 6d.]



velocity equal to the linear velocity of the band 2. On the axis of the roller 3 and outside the kinematograph 1 is provided another roller 32 over which a cord 4 is guided. The diameter of the roller 32 is greater than that of said roller 3. The cord 4 drives a small roller 33 on the shaft of which is secured another roller 5 which moves a steel band 6 with a velocity exceeding the velocity of the kinematograph film 2. The steel band 6 passes between the cores of two electromagnets 7 which are connected with a source of current (battery 8) and a microphone receiving the sound waves. The sound waves serve in effect to produce in the electromagnets 7 fluctuations of current which effect a corresponding local magnetisation of the steel band 6. At the same time the corresponding images are photographed on the film band 2. 5 10

In the exhibiting apparatus according to Fig. 2 the images are projected by an apparatus 9 on to a screen 10. On the shaft of the driving roller 35 actuating the film band 2 is fixed a larger roller 11 which is coupled by a transmission connection 12 to a small roller 13. On the axis of the roller 13 is provided another roller 34 which serves as a guide for the magnetised steel band. By the driving force of the roller 34 the steel band 6 is passed between the cores of two electromagnets 14 which are connected to a strengthening relay 15 (for instance a Lieben-tube). The fluctuations of current originated in the electromagnets 14 produce correspondingly strengthened fluctuations in the circuit of a powerful source of current (battery 16) which fluctuations are transmitted to a loud speaking telephone 17 provided near the screen 10. Thus, the telephone 17 reproduces the sounds, conversations or the like in synchronism with the exhibition of images by the kinematograph, it being a presupposition of course that the ratio between the speeds of the steel band and the film band of the exhibiting apparatus is equal to the ratio between the corresponding velocities of the steel band and kinematograph driving mechanism shown in Fig. 1. 15 20 25

In Fig. 3 is illustrated a device which permits disconnection of the coupling between the kinematograph and the apparatus for reproducing records, if it be desired for any reason (for instance for producing particular effects) to stop the film and to allow the mechanism for reproducing sounds to continue its operation. 30

On the shaft 18 which is continuously rotated by a motor 22 is keyed a roller 36 for moving the steel band and one member 19 of a clutch, the other member 20 of the clutch being loosely mounted on the shaft. On the clutch member 20 is secured the roller 21 forming a transmission element for the driving mechanism of the film band. The clutch member 20 is provided with a peripheral groove which is engaged by the one end of a lever 30. A spring 31 tends to move the two clutch members into engagement with each other. The other end of the lever 30 forms an armature which, when attracted by the energization of an electro-magnet or solenoid 29, is moved in opposition to the spring 31 so that the clutch member 20 is shifted out of engagement with the clutch member 19 and the actuating device for the film band brought out of operative relation with the driving means. By operating a contact button 27 the electromagnet 29 is supplied with energy from a source of current 28. The electromagnet 29 may also automatically be included in the circuit. For this purpose the shaft 18 is provided with a worm 23 which engages a worm wheel having a projection 24. In operation the projection 24 actuates the free end of a bell-crank lever 25 which closes a contact 26 so that the electromagnet 29 is supplied with current and the clutch member 20 moved into its operative position. As soon as the projection 24 has passed the end of the lever 25, the contact 26 is opened. The time during which the contact 26 is closed depends upon the form of the projection. 35 40 45 50

The lever 30 may also be operated by hand.

The operative relation between the driving mechanism of the film band and the driving mechanism of the steel band may be produced electrically. In recording sounds or the like, several steel bands may simultaneously be acted upon in parallel in order to save or facilitate subsequent duplication. 55

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A system for recording and reproducing sounds and for photographing
5 and exhibiting images, consisting of a kinematograph and a talking machine for Poulsen Phonographic records combined therewith, characterised by the fact that the record band is arranged to be operated at a higher velocity than the film band, with the object of producing a more precise record and reproduction of the sounds.
- 10 2. A system as claimed in Claim 1, characterized by the fact that the kinematograph is at predetermined intervals automatically connected with and disconnected from the talking machine by means of a switching device which is controlled by the driving mechanism of the record band.
- 15 3. A system as claimed in Claim 1, characterized by the fact that the sounds are recorded on a plurality of steel bands in the recording apparatus in order to save or facilitate subsequent duplication of the records.

Dated this 22nd day of June, 1916.

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20 Director,
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[This Drawing is a reproduction of the Original on a reduced scale.]

