J. GREENBAUM.

FILM AND METHOD OF SYNCHRONIZING THE OPERATION OF KINEMATOGRAPHS AND TALKING MACHINES.

APPLICATION FILED JAN. 27, 1909.

1,027,248. Patented May 21, 1912.

Fig.1.

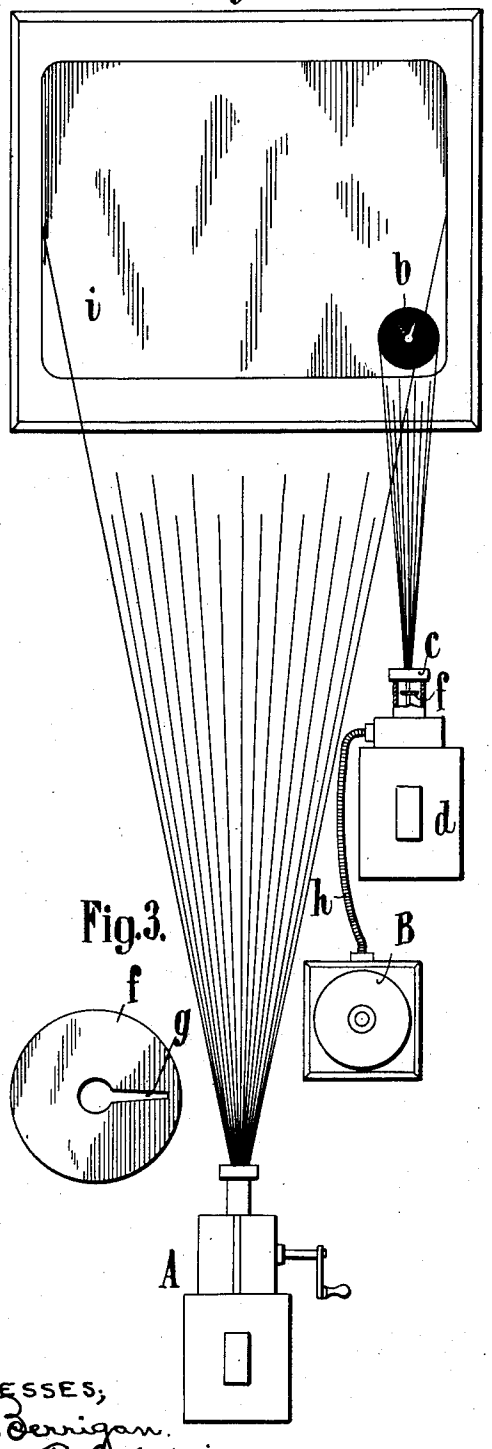

Fig.2.

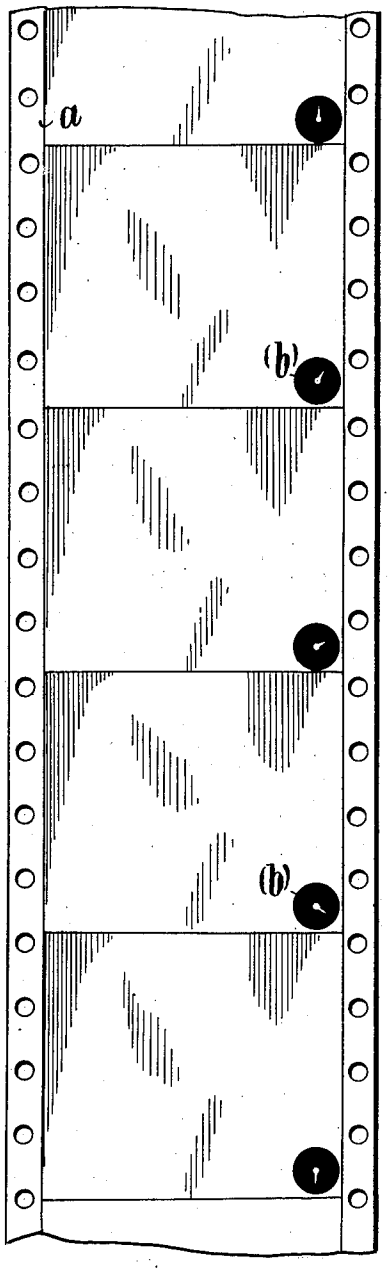

Fig.3.

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FILM AND METHOD OF SYNCHRONIZING THE OPERATION OF KINEMATOGRAPHS AND TALKING-MACHINES.

1,027,248. Specification of Letters Patent. Patented May 21, 1912.

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To all whom it may concern:

Be it known that I, JULES GREENBAUM, a citizen of the United States of America, and residing at Berlin, Germany, have invented a new and useful Improved Film and Method of Synchronizing the Operation of Kinematographs and Talking-Machines; and I do hereby declare the following to be a full, clear, and exact description of the same.

The present invention relates to the control of the conjoint action of kinematographs and talking machines, and a primary object is to facilitate the synchronization of the visual and acoustic records during the reproduction. The method adopted for this purpose, according to the present invention, substantially consists in including in the subject-matter of the photographic record an object, for example a rotating pointer, which moves at a rate proportionate to the rate of movement of the kinematographic apparatus, so that successive phases of movement of this object appear on successive pictures, and in projecting onto the screen, during the reproduction, an image of another object, for example another pointer, which is moved by the mechanism of the talking machine at the same rate as the photographic object. In the animated photograph the photographed pointer appears, of course, in a state of continuous rotation. During the reproduction the images of the two pointers are kept under observation. While the talking machine and kinematograph are working synchronously, the two pointer-images maintain a uniform relation to each other as regards position. Any disturbance of synchronism is immediately indicated by disturbance of this uniform relation, and can then be corrected by known means.

Apparatus for carrying the invention into practice is illustrated by way of example in the accompanying drawing, in which—

Figure 1 is a diagram of an apparatus for carrying out my new method. Fig. 2 represents a piece of kinematographic film, on an enlarged scale, with the control indicator photographed thereon, and Fig. 3 represents a detail of apparatus used for the purposes of the invention.

At the time of taking the pictures a clock-like device with a black face or disk and white pointer is arranged on the stage used. The white pointer is uniformly rotated by the kinematographic apparatus, by means of suitable connecting mechanism, so that the successive phases of the rotation are represented on the film *a* of the kinematograph A, as shown in Fig. 2. When reproducing the pictures the white pointer shows of course on a black field *b* in the picture and appears to be in continuous rotation.

In the objective tube *c* of a projection apparatus *d* there is a disk *f*, having a pointer-shaped aperture *g*, as clearly shown in Figs. 1 and 3. This disk is rotated by means of a flexible shaft *h* connected to the actuating mechanism of the talking machine B. An image of the aperture is thus projected, to represent a white pointer on a black field, and the projection is so arranged that the image of the disk *f* exactly coincides with the black, circular field *b* in the kinematographic picture. Consequently only a single black field appears on the screen *i*, but there are two pointer images, one in the picture itself, and the other the projected image of the aperture in the disk *f*. When the two machines are working synchronously the two pointer images coincide with each other, and only one pointer image is apparent. If, however, a disturbance of synchronism occurs the pointer image of the disk appears at some other part of the black field, so that the disturbance is indicated and can be corrected by known means, by acceleration or retardation of the kinematograph.

What I claim as my invention and desire to secure by Letters Patent is:

1. The herein described method of synchronizing the operation of a kinematograph and talking machine consisting in projecting on to a screen a succession of pictures, each bearing marks to indicate the speed at which the pictures should be reproduced, and independently projecting upon said screen marks to indicate the speed at which the talking machine is being operated, and varying the relative speed of the two apparatus referred to, to preserve a uniform relative position of the marks referred to upon the screen.

2. The herein described method of synchronizing the operation of kinematographs and talking machines consisting in projecting on to a screen a succession of pictures

each bearing marks which appear to rotate at the speed at which the pictures should be reproduced, and independently projecting upon said screen separate marks which appear to rotate at the speed at which the talking machine is being operated and varying the relative speeds of the two apparatus referred to to preserve a uniform relative position of the marks upon the screen.

3. The herein described method of synchronizing the operation of kinematographs and talking machines consisting in projecting on to a screen a succession of pictures each bearing marks which appear to rotate at a speed at which the pictures should be reproduced, and independently and simultaneously with the aforesaid projection on the pictures upon the screen rotating a part having a slit therein, the last named rotation being at a speed at which the talking machine is being operated, and projecting an image of said slit upon the portion of the screen bearing the marks first mentioned.

4. A film for a moving picture machine having thereon marks or devices to indicate the speed at which the machine should be operated.

5. A film for a moving picture machine having thereon a series of progressive marks or devices adapted to be thrown on a screen to indicate the speed at which the machine should be operated.

6. A moving picture film or record provided with a consecutive series of marks indicating the speed at which the film should be moved to time it with the movement of a talking machine.

7. A moving picture film or record provided with a progressive series of marks adapted when consecutively thrown on a screen to form a visible indicator of the speed of the film.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

JULES GREENBAUM.

Witnesses:
HENRY HASPER,
WOLDEMAR HAUPT.