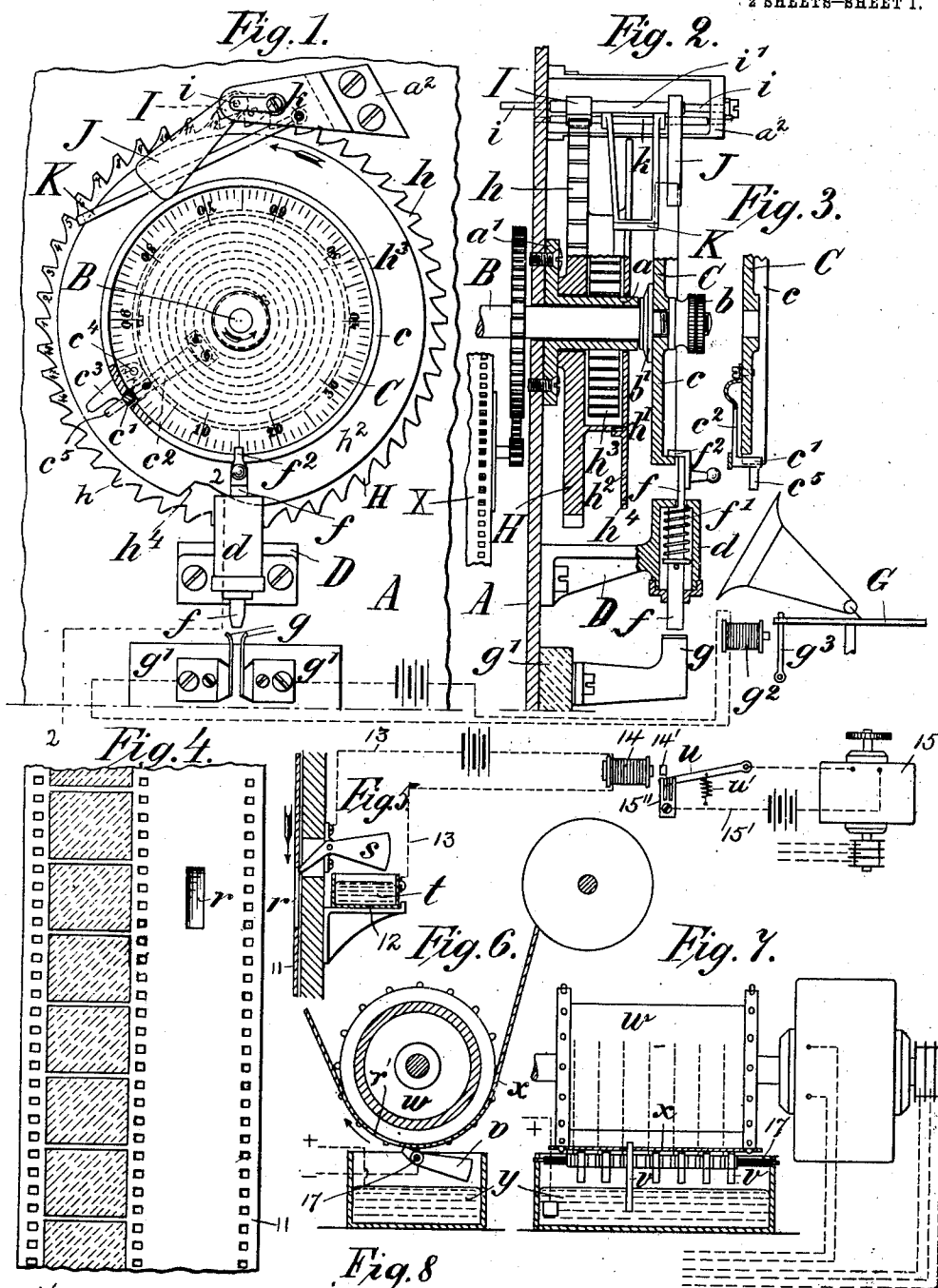


F. E. THORMEYER.
 MEANS FOR CONTROLLING THE TIME OF STARTING PHONOGRAPHS AND THE LIKE.
 APPLICATION FILED DEC. 20, 1905.

1,049,171.

Patented Dec. 31, 1912.

2 SHEETS—SHEET 1.



Witnesses.
 W. Rommers
 Ed. Simmel

Fig. 8
 I i h

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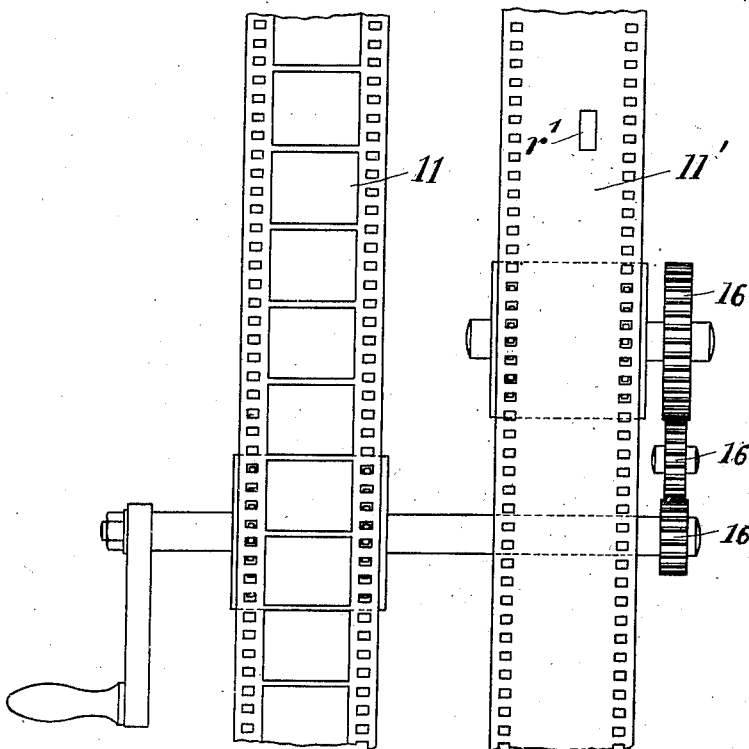
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2 SHEETS—SHEET 2.

Fig. 4^a.



Witnesses.

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FRANZ EWALD THORMEYER, OF HAMBURG, GERMANY.

MEANS FOR CONTROLLING THE TIME OF STARTING PHONOGRAPHS AND THE LIKE.

1,049,171.

Specification of Letters Patent.

Patented Dec. 31, 1912.

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To all whom it may concern:

Be it known that I, FRANZ EWALD THORMEYER, a citizen of the German Empire, residing at Hamburg, Germany, have invented certain new and useful Means for Controlling the Time of Starting Phonographs and the Like in Producing Animated Audible Scenes or Pictures, of which the following is a specification.

In producing audible animated pictures it is necessary to start the talking machine, the needle of the diaphragm of which, is placed on the phonic line of the disk or roll at a certain place, by hand at the right moment in such manner, that the first sound of the talking machine is heard at the same time in which the picture of the kinematograph or the like belonging to this sound appears. Since the starting of the talking machine with regard to the film of the kinematograph must take place in the very precise moment required, the difficulty in starting the talking machine at the correct time is so great that in spite of all signs or signals it cannot be overcome.

Let it be understood that by the expression kinematograph I do not only include kinematographs proper, but also kinetoscopes or any other apparatus by means of which animated or moving pictures, figures, or scenes are produced and by the expression talking-machines I mean to imply any kind of apparatus, by means of which sounds are reproduced, such as musical instruments, gramophones, phonographs and the like.

The object of the present invention is to enable such timely starting of the second apparatus once the other has been in operation for some time, whereupon both apparatuses move synchronously. This is done by transferring the moving length of the film or the like passing the opening of the kinematograph or the like between the first picture and that one, on the passing of which the talking machine is to be set in motion, on to a movable surface of a carrying mechanism, which either gives a signal for starting the talking machine or starts this machine itself automatically or by aid of electrical, mechanical, pneumatic or other means. This transferring of the moving length on to the surface of said movable mechanism implies that two points be marked by any desired means on said surface, one being the starting mark for the

first apparatus and the other indicating the moment in which the second apparatus is to be started, it being taken for granted that the reproducer or needle is placed on the phonic line of the disk or roll beforehand, that is to say at a predetermined point in a certain convolution of this line. It is not necessary that the said moving length of the film be transferred to the starting device itself, but it may be advantageous, to transfer the corresponding measure of motion of the film driving mechanism on to the starting mechanism either directly or at a suitable reduction and synchronously at any distance from the apparatus. Evidently the talking machine may be started first and the other apparatus later on.

The invention explained above will be better understood by aid of the following example.

If for instance a film carries 100 consecutive pictures, the measure of motion, which is necessary to display all pictures, therefore amounts to one hundred times the length of a single picture. This measure of motion is transferred to a starting-device, which may consist of a disk or a cylinder, divided on its surface into 100 equal parts and rotated by the driving mechanism of the film, in such manner that the movement of the disk corresponds step for step with the movement of the 100 pictures. If, for instance at the fifteenth picture the talking machine is to be set in motion, the starting device must have moved for fifteen single lengths of the divisions marked thereon, when the said picture passes the opening or window of the kinematograph, whereupon either a signal is given or any suitable means arranged or adjusted on the fifteenth line of division sets the talking machine in motion, the needle of the diaphragm of which has been previously placed on the phonic line of the disk at the place signified.

In carrying out this method of adjusting the measure of motion for the talking machine in producing animated audible pictures, any means may be employed, which by the movement of the film or its driving mechanism transfers the number of the pictures moving in front of the window of the kinematograph in units of the length of picture and which sets one or more talking machines or other apparatus at once, or one after the other in motion, by means

of suitable adjustable devices. Under certain circumstances it may be advisable to make use of the film itself or a ribbon running along with the film or at any distance from the apparatus as starting device. When making use of this arrangement more than one talking machine or other apparatus may be employed together or one after the other.

The novel details in the construction and arrangement of the several parts will be understood from the detailed description hereinafter when read in connection with the accompanying drawings forming part hereof and wherein a convenient embodiment of the invention is illustrated.

In the drawings—Figure 1 is an elevation of a starting device arranged according to this invention. Fig. 2 is a vertical section drawn to the line 2—2 of Fig. 1. Fig. 3 shows a detail of this device. Fig. 4 shows a film combined with a band moving in unison therewith. Fig. 4^a shows a modification of the film shown in Fig. 4. Fig. 5 is a sectional elevation of an electric starting device, operated by the band shown in Fig. 4. Fig. 6 shows a modification of the device shown in Figs. 4 and 5 and Fig. 7 shows a sectional elevation of the same drawn at a plane at right angles to that of Fig. 6. Fig. 8 is a detail view of the main wheel and its controlling pawl.

The device shown in Figs. 1 to 3 consists of a supporting plate A having a bearing sleeve *a* secured thereon by means of screws passing through a flange *a'* formed on the sleeve. Mounted in the sleeve *a* is a shaft B which is driven from the film driving mechanism of a kinematograph, shown diagrammatically at X, at a speed of one revolution to every hundred lengths of pictures or one hundred exposures on the film. A dial C is mounted on the shaft B and is connected thereto by means of a nut *b* which clamps the dial against a collar *b'* formed on the shaft. The dial C is provided with a flange *c* inside of which there are the hundred divisions. Opposite the zero division is a gap in said flange which is normally closed by a filling piece *c'*, carried by an elastic arm *c²* and held in its place by a latch *c³* pivoted on the back of the dial at *c⁴*. An arm D attached to the supporting plate A carries a socket *d*, in which a bolt *f* is arranged to slide, operated by a spring *f'*, which has the tendency to move the bolt downward with one end in between two contact-pieces *g* of an electric circuit *g'*. The other end of said bolt is provided with a nose *f²* normally resting against the inner face of the flange *c*. The bolt *f* is held in the position shown in the drawing as long as the filling piece *c'* closes the gap in the flange *c*, but when this filling piece is withdrawn, the nose *f²* may pass through the

gap of the flange as soon as it presents itself, thus making contact between the contact-pieces *g*, completing the circuit in wires *g'* which energizes a magnet *g²*, attracting an armature *g³*, which up to the time of completing the circuit has served as a brake for the graphophone disk, designated by G, the latter being driven in the well known manner by a spring or otherwise.

On the sleeve *a* is loosely mounted a wheel H having teeth *h* formed on its periphery. On the front face of this wheel is a casing formed by a circular flange *h'* carrying a plate *h²* which forms a cover for the casing. Within the casing is mounted a spiral spring *h³* which has its inner end secured to the sleeve *a* and its outer end secured to the circular flange *h'* so that when the wheel is rotated by hand, in the direction of the arrow shown in Fig. 1, the spring is put under tension.

A bracket *a²* is secured to the supporting plate A above the wheel H and in this bracket is mounted a bar *i* having a sleeve *i'* rotatable and longitudinally movable thereon. Fixed on the sleeve is a pawl I, adapted to engage the teeth *h* of the wheel and a weighted lever J the free end of which rides on the outer periphery of the flange *c* of the dial C. A yoke K having a pivot pin *k* journaled in the supporting plate A, bears on the periphery of the cover *h²*, the purpose of which will be hereinafter explained.

If it is desired to work together a phonograph and a kinematograph, the shaft B of the device shown in Figs. 1 to 3 is connected to the driving member of the kinematograph either directly or by a suitable gearing and the phonograph driven by any well known means is controlled by the armature *g³* which is operated by the magnet *g²* connected to the terminals *g* through wires *g'*. The kinematograph having been started in the usual manner and if it is desired to start the phonograph simultaneously with the 1215th picture of the kinematograph the latter before being put in motion is set in such manner that its first picture is brought before an opening of the kinematograph. The dial C is now loosened from the shaft B by unscrewing the nut *b* and turned until the gap in its flange *c* is opposite the nose *f²* of the bolt *f*. The latter is now raised until its nose projects inside of the flange *c* whereupon the dial is further rotated until the fifteenth divisional line of the dial is opposite the nose as shown in Fig. 1. The dial is now made fast to the shaft A by screwing up the nut *b*. The wheel H is now rotated against the stress of the spiral spring *h³* until the latter is wound up and in the example above stated the wheel is brought in such position that the double-armed pawl I projects between the

teeth 12 and 13 on wheel H. The wheel shown has 48 teeth and may therefore be used for a film having 4,800 pictures. With the wheel and dial thus set the latter upon the starting of the kinematograph will rotate first about an angle corresponding to 15 of its division and 12 complete revolutions in which time 1215 pictures will be exposed. During this period of movement of the dial, the gap in the flange *c* is kept closed by the filling piece *c'* to prevent the bolt *f* from dropping down and coming into contact with the terminals *g* thus preventing the closing of the circuit. The opening of the gap at the proper moment, *i. e.*, after the dial has moved from 15 to 0 and made 12 complete revolutions, is accomplished in the following manner.

On each revolution of the dial the weighted lever *J* is raised by a projection *c⁵*, on the filling piece *c'*, and drops after said projection has passed. This raising and dropping of the lever *J* raises and lowers the double-armed pawl *I* and allows the wheel *H* to be rotated the distance between two teeth by the stress of the spring *h³* in a direction reverse to that indicated by the arrow Fig. 1. When the toothed wheel has thus been rotated the distance of twelve teeth, (on 12 revolutions of the dial) the yoke *K* drops down into a gap *h⁴*, formed in the periphery of the cover *h²* and enters the path of the latch *c³* protruding from the rim of the dial.

On the further rotation of the dial *C* the latch *c³* strikes against the yoke *K* and is thereby rotated about its pivot, releasing the arm *c²* of the filling-piece *c'*, which by the tension of its spring is drawn away thus opening the gap and allowing the nose of the bolt *f* to pass there-through as soon as the 1215th picture of the kinematograph appears. The bolt *f* makes contact between the contact-pieces *g* and closes the electric circuit by means of which the talking machine designated by *G* or the second kinematograph not shown in the drawing is set in motion. In Figs. 4 and 5 an arrangement is shown, from which it may be gathered that the film 11 itself may form the means for starting the second apparatus, if made of such breadth that alongside of the series of the pictures there is sufficient space to arrange a slot *r* at the proper place, by means of which a weighted contact lever *s* resting normally against the film 11 is released. Below the weighted end of the lever *s*, there is a metal cup 12 filled with mercury *t* and attached to one pole of a conductor 13, the lever *s* being in electrical connection with the other pole of the conductor.

An electro-magnet 14 is included in the circuit and has an armature 14' normally held out of contact with the magnet by a spring, not shown. An electric motor, as

15, is provided for operating a talking machine or a second kinematograph, or the like, not shown, and said motor is connected with its source of power through the circuit 15' which includes a circuit closer in the form of a pivoted arm *u* which is operated to close the circuit by means of a spring *u'* as hereinafter described.

When the kinematograph is started the circuit 13 is open, due to one end of the pawl *s* being engaged by the film which holds the weighted end raised above the cup 12. The circuit 15 is also open at this time, as the circuit closer *u* rests on the armature 14'. However, as soon as a slot *r* in the film reaches the lever *s* the latter is released and the weighted end drops down into the mercury cup 12 thus closing the circuit 13, exciting the electro-magnet 14 which attracts the armature 14' and the circuit closer *u* is released whereupon the spring *u'* causes the latter to swing into contact with the pole piece 15' closing the circuit 15 and starting the motor. The instant the slot *r* passes the lever *s* the latter is again raised by the film and the magnet 14 deenergized, allowing the armature 14' to be retracted by its spring without, however, acting on the lever *u*, which remains in the closed position as shown in Fig. 5. The motor once started runs as long as the performance takes place, unless the lever *u* is moved by hand to break the circuit.

Instead of making contact with a mercury-bath for starting the talking-machine electrically the lever *s* may be employed merely as a signal, the moving of which will give the operator a sign at the correct moment, in which he may start the talking-machine by hand.

There may be two films as 11 and 11' shown in Fig. 4^a instead of a single broad one, the film 11 carrying the series of pictures and the other 11' running alongside at any distance from the first, being provided with the slot *r'*, at the proper place. The second film may also be driven by gearing 16 to a different speed at a prescribed rate. Preferably in such cases the second film is driven slowly, but at such a rate that the slot passes a lever or pin at the moment the pictures appear, on which the talking machine is to be started.

Evidently more than one machine may be started at the right moment by means of this kind. This may be necessary when for instance musical instruments are to be started some time later than a talking machine, for creating special musical effects, or, when shots of a gun are to be heard or the like. To this end a number of contact-levers *v* being in electrical connection with one pole of a conductor may be pivotally arranged on a common shaft of insulating material, Figs. 6 and 7,

which has its bearing in the opposite walls of a vessel y containing mercury and attached to the other pole of the conductor. A drum w surrounded by a long hand x is journaled above the vessel, in such manner as to give a support to the ends of the levers v to hold the weighted end of these levers at some distance above the mercury. Slots r' in the band x which correspond to certain pictures displayed by the cinematograph permit of the levers being released at the proper moments, to set various apparatus of any desired description in motion. For instance also two cinematographs or two musical instruments or talking-machines may be set in motion one after the other by means described above.

I claim:

1. The combination with a picture reproducing machine, driving means therefor and a sound reproducing machine, of a releasing device for the latter and means operated synchronously with the movement of the picture reproducing machine adapted to actuate the releasing device at any predetermined period.

2. The combination with a talking machine and a cinematograph and driving means for the latter, of a releasing device for the talking machine, means to actuate the releasing device, and means between the driving mechanism and actuating means to permit the operation of the latter at any predetermined period.

3. The combination with a talking machine, a cinematograph and driving means for the latter, of a shaft driven by said means, a releasing device for the talking machine, means to actuate the releasing device and means between the shaft and actuating means to permit the operation of the latter at any predetermined period.

4. The combination with a talking machine, a cinematograph and driving means for the latter, of a shaft driven by said means, a releasing device for the talking machine, means to actuate the releasing device and adjustable means between the shaft and actuating means to permit the operation of the latter at any predetermined period.

5. The combination with a picture reproducing machine, driving means therefor and a sound reproducing machine, of a releasing device for the latter, an electric circuit for actuating the releasing device, a circuit closer, means for supporting the latter, and means operated by the movement of the picture reproducing machine to release the closer from the support.

6. The combination with a picture reproducing machine, driving means therefor and a sound reproducing machine, of a releasing device for the latter, an electric circuit for actuating the releasing device, a cir-

cuit closer, a support for the closer moved from the driving means of the picture reproducing machine, and means to release the closer from the support at any predetermined period.

7. The combination with a picture reproducing machine, driving means therefor and a sound reproducing machine, of a releasing device for the latter, an electric circuit for actuating the releasing device, a gravity operated circuit closer, an annular support for the latter rotated from the driving means of the picture reproducing machine, a plug in the support, and means operated by the revolutions of the support to withdraw the plug to permit the closer to close the circuit.

8. In a device of the character described, the combination with a talking machine, a cinematograph and driving means for the latter; of a shaft driven by the driving means, a disk on the shaft, an electric circuit, a releasing device for the talking machine actuated by the circuit, a circuit closer, means on the disk for supporting the latter, and means to release the closer from the support at a predetermined number of revolutions of the disk.

9. In a device of the character described, the combination with a talking machine, a cinematograph and driving means for the latter; of a shaft driven by the driving means, a dial adjustably mounted on the shaft, a notched flange on the dial, a filling member normally closing said notch, an electric circuit, a circuit closer, a releasing device for the talking machine actuated by the circuit closer supported by the flange, and means to withdraw the filling member from the notch at a predetermined number of revolutions of the dial.

10. In a device of the character described, the combination with a talking machine, a cinematograph and driving means for the latter; of a shaft driven by the driving means, a dial on the shaft, a notched flange thereon, a spring-controlled member to close the notch, a latch for said member, a circuit closer supported by the flange, an electric circuit, a releasing device for the talking machine operated by the circuit, and means to trip the latch to remove the spring-controlled member from the notch.

11. In a device of the character described, the combination with a talking machine, a cinematograph and driving means for the latter; of a shaft driven by the driving means, a dial on the shaft, a flange on the dial having a notch therein, a spring-actuated member normally closing the notch, an electric circuit, a releasing device for the talking machine operated by the circuit, a circuit closer normally supported by the flange, a spring-controlled disk having a peripheral gap, a toothed wheel carrying the disk, 13

a stop device for the wheel, a projection on the flanged dial to operate the stop device, a yoke bearing on the disk adapted to enter the peripheral gap, a latch for the spring-actuated member adapted to be engaged by the yoke when the latter is in said peripheral gap.

12. In a device of the character described, the combination with a stationary support; of a bearing sleeve fixed thereon, a shaft rotatably mounted in the sleeve, a dial adjustable on and rotatable with the shaft, a toothed wheel rotatable on the sleeve, a casing fixed on the wheel, a top on the casing, a spring connecting the casing and sleeve, a pawl in engagement with the wheel, a weighted lever connected with said pawl, a notched flange on the dial, a spring-actuated member carried by the flange on the dial, a latch pivoted on the latter to normally hold the spring-actuated member in the notch, a projection on the latter adapted to raise the weighted lever and operate the pawl to permit the wheel to be rotated by the spring, a circuit closer having a nose adapted to pass through said notch and rest on the flange, and a yoke adapted to take into a gap in the casing cover and release the spring-actuated member from the latch.

13. The combination with a kinematograph, driving means therefor and a talking machine, of a releasing device for the latter, and means operated synchronously with the movement of the kinematograph adapted to determine the moment the releasing device is to be actuated.

14. The combination with a talking machine, a kinematograph and driving means for the latter; of a shaft driven synchro-

nously with said means, a releasing device for the talking machine, means to actuate the releasing device, and means between the shaft and actuating means to permit the operation of the latter at any predetermined period.

15. The combination with a talking machine, a kinematograph and driving means for the latter; of a shaft driven synchronously with said means, a releasing device for the talking machine, means to actuate the releasing device, and adjustable means between the shaft and actuating means to permit the operation of the latter at any predetermined period.

16. The combination with a picture reproducing machine, a sound reproducing machine comprising a phonic-line-carrier and a reproducer, driving means for the picture reproducing machine, and driving means for the sound reproducing machine, of a revoluble part running synchronously with the picture reproducing machine and provided with two marks, one determining the moment at which the picture reproducing machine is set in motion and the other the moment the sound reproducing machine is to be set in motion, the reproducer being adapted to be placed on a predetermined place in the phonic line of the sound reproducing machine.

In testimony that I claim the foregoing as my invention, I have signed my name in the presence of two subscribing witnesses.

FRANZ EWALD THORMEYER.

Witnesses:

ERNEST H. L. MUMMENHOFF,
IDA CHRIST HAUFERMANN.