

F. E. THORMEYER.
 DEVICE FOR CONTROLLING THE OPERATION OF TWO REPRODUCING APPARATUS.
 APPLICATION FILED JULY 28, 1909.

989,207.

Patented Apr. 11, 1911.

2 SHEETS—SHEET 1.

Fig. 1.

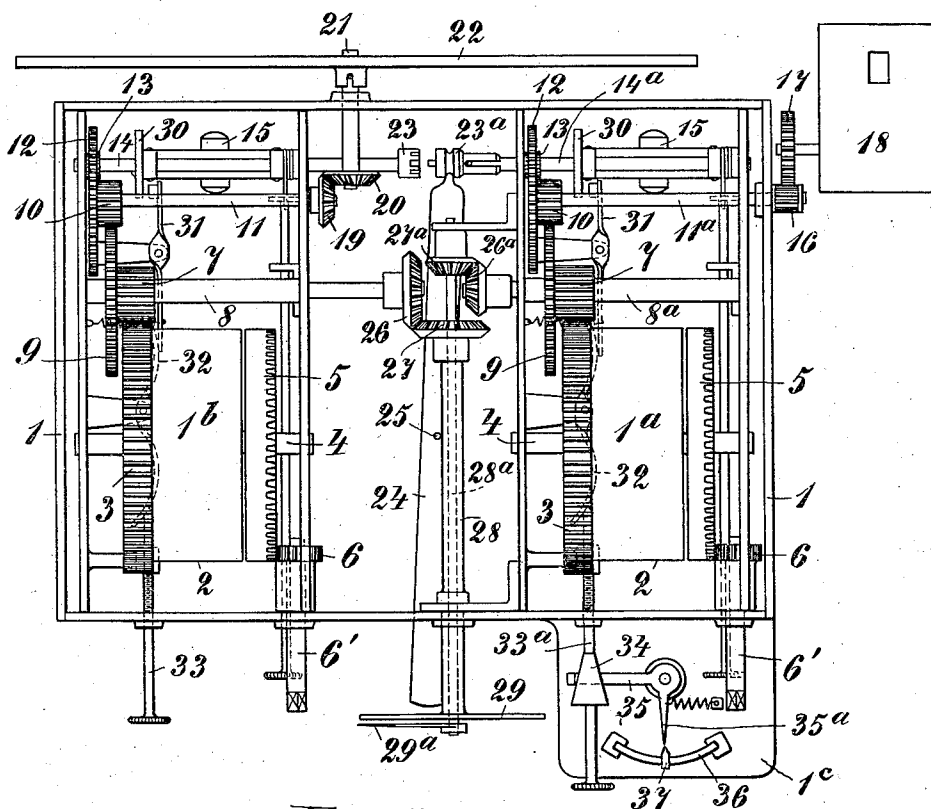
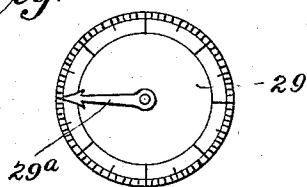


Fig. 5.



Witnesses.

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2 SHEETS—SHEET 2.

Fig. 2.

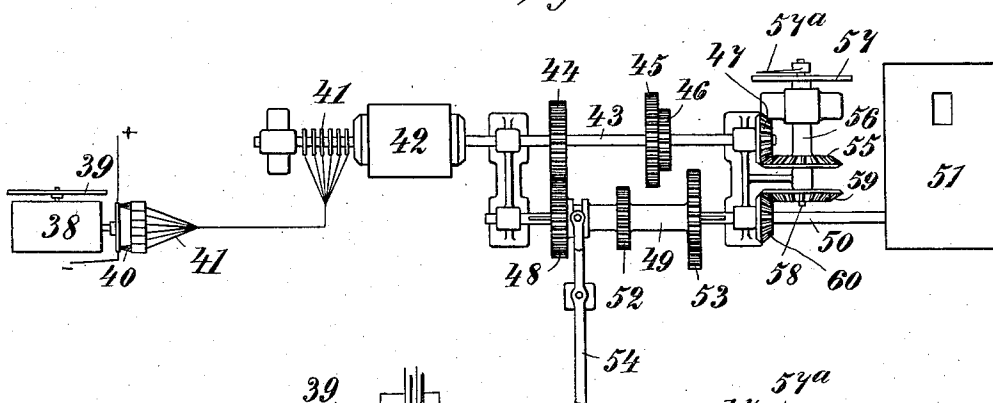


Fig. 3.

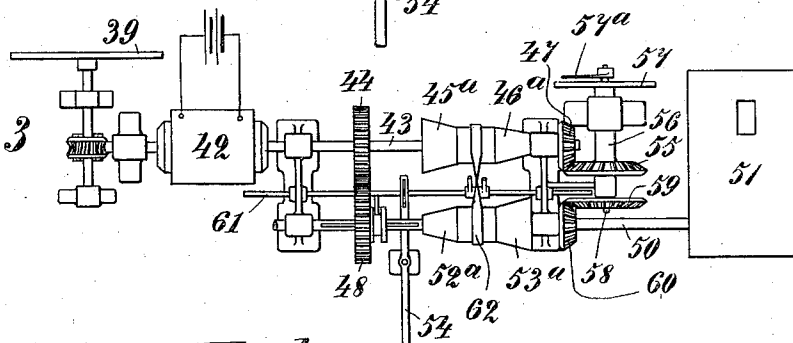
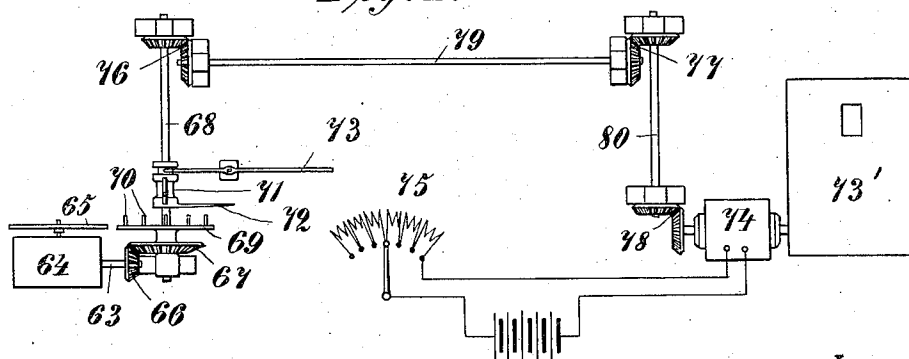


Fig. 4.



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FRANZ EWALD THORMEYER, OF HAMBURG, GERMANY.

DEVICE FOR CONTROLLING THE OPERATION OF TWO REPRODUCING APPARATUS.

989,207.

Specification of Letters Patent.

Patented Apr. 11, 1911.

Application filed July 28, 1909. Serial No. 510,028.

To all whom it may concern:

Be it known that I, FRANZ EWALD THORMEYER, a citizen of Hamburg, in the German Empire, have invented a new and useful Device for Controlling the Operation of Two Reproducing Apparatus, hereinafter fully specified.

This invention relates to a device for controlling the operation of two or more reproducing apparatus such as kinematographs, talking machines, musical instruments, movable figures and the like, which are driven by separate means. Part of my invention also refers to devices of this kind, where only one driving mechanism is employed to operate two machines of the named description.

In working two or more reproducing apparatus such as picture exhibiting apparatus, kinematographs, talking-machines, musical instruments and the like heretofore merely speed-indicating means were employed, which had the drawback, that the apparatus had to be continuously and carefully watched and regulated while running. Moreover apparatus have been used heretofore consisting of a hand driven kinematograph and a motor-driven gramophone, phonograph or talking-machine, between which clutch members are arranged having a certain amount of play, so as to allow a certain freedom of motion of the kinematograph only for about one revolution of the talking machine. This apparatus has the disadvantage that the clutch members catch hold of one another so that one driving mechanism is positively driven by the other and that there is no chance to regulate the speed of one apparatus independently from the other, when it should be necessary to compensate a disturbance during the performance.

According to the present invention speed indicating means are used for both apparatus in combination with a regulating device and means to operatively connect driving mechanism of the two apparatus in such a manner, that normally the positive connection, which might be attained by a clutch or the like, keeps the apparatus running synchronously, while as soon as some disturbance takes place, for instance when the needle or stylus jumps from its proper place on the record to another convolution of the phonic line, the operator has to change the speed of one apparatus by the aid of the regulating device at the same time watching

the speed indicating means. When by such alteration of speed the two apparatus again work together, that is to say, when for instance in case of kinematograph and talking machine the right words are spoken to the corresponding movements of the picture, the clutch is again thrown into gear or otherwise the positive driving mechanism is used again to obtain further synchronism.

According to another part of the present invention the positive connecting device between gearings of the apparatus is combined with the regulating device so as to form one single mechanism. Also the speed indicating devices may be combined with a clutch mechanism to form a single mechanism for itself.

Figure 1 of the accompanying drawings shows diagrammatically a kinematograph and a talking-machine driven by two separate motors in connection with a device constructed according to the present invention. Fig. 2 shows diagrammatically a similar plant, in which the regulating means are combined with a positive connection between the two apparatus. Fig. 3 shows a modification of the last named combination and Fig. 4 shows diagrammatically a similar plant, in which the speed indicating devices are combined with a clutch mechanism. Fig. 5 is a detail front view of the indicating device.

In the plant shown in Fig. 1 the driving mechanisms comprise two spring motors 1^a and 1^b arranged in a common frame 1 and may be of any usual construction. The drums 2 of the motors containing the usual driving springs (not shown) are provided with a gear 3 and on each shaft 4 on which the drums are loosely arranged a toothed wheel 5 is keyed which is in mesh with a pinion 6. The shaft 6¹ of this pinion can be rotated by the aid of a suitable key to wind up the spring, which is fastened to the shaft 4 with one end and to the drum 2 with the other end. The gear 3 is in mesh with a pinion 7 fixed on a shaft 8 (or 8^a respectively) carrying a gear 9, which is in mesh with a pinion 10 on another shaft 11 (or 11^a respectively) carrying a gear wheel 12. The last named gear wheel is in mesh with a pinion 13 on the shaft 14 (or 14^a respectively) of the usual weight-regulator 15. The shaft 11^a of the motor 1^a on its outer end carries a pinion 16 in mesh with the driving gear 17 of the kinematograph 18 and the shaft 11 of the motor 1^b carries at

its outer end a conical wheel 19 in mesh with a conical wheel 20 on the spindle 21, to which is attached the carrier-disk 22 for the record. The shafts 14 and 14^a, of the two driving mechanisms are arranged in a line, and are provided with prolongations carrying clutch members 23 and 23^a, of which 23 is fast on the shaft 14 while 23^a is movable in a longitudinal direction on the shaft 14^a, to throw the clutch in and out of gear, which may be done by a lever 24 pivoted at 25 to the frame not shown. The shaft 8, which may also be in a line with the shaft 8^a carries a conical wheel 26 in mesh with a similar wheel 27 and the shaft 8^a a somewhat smaller conical wheel 26^a in mesh with a similar wheel 27^a. The shaft 28 of the wheel 27 is hollow and surrounds the shaft 28^a. To the front end of the shaft 28 an indicating disk 29 is adjustably attached provided with a single or double dial (not shown) and to the front end of the shaft 28^a a pointer 29^a is fixed preferably also adjustably. The pointer 29^a can move in front of the disk 29, the zero line of which, may also be considered a pointer. If a double dial is made use of one circle of divisions corresponds with the number of revolutions of the record of the talking-machine and the other circle of divisions corresponds with the numbers of pictures exhibited during one revolution of the record. The speed of the driving mechanisms is so regulated that the pointer 29^a continuously coincides with the zero line of the dial on the disk 29.

The driving mechanisms are provided with usual regulating means consisting of a brake disk 30 attached to the shaft 14 or 14^a respectively, a brake lever 31, a two armed lever 32 and an adjusting screw 33 or 33^a respectively. The two armed lever 32 is spring pressed and so shaped, that on an inward motion of the screw 33 it is rocked on its pivot and turns the brake-lever 31 in such direction, that its inward end presses more or less against the brake disk 30 to regulate the speed of the motor.

The adjusting screw 33^a of one driving mechanism is provided with a cone 34 adapted to contact with a spring-pressed bell-crank lever 35 one arm 35^a of which is shaped to constitute a pointer. Opposite the path of this pointer there is a segment 36 attached to a bracket 1^c on the frame 1 and provided with a scale and on this segment a loose pointer 37 is held by friction so that it can slide along the segment.

Now when the driving mechanism of the talking machine is allowed to run at its normal speed, that is to say the record carrier making 80 revolutions in the minute, the speed of the other driving mechanism is regulated by adjusting the screw 33^a until it

can be seen by the position of the pointer 29^a with respect to the zero line on the disk 29 that both driving mechanisms run synchronously. In adjusting the screw 33^a the cone 34 acts on the spring-pressed bell-crank lever 35 to move the pointer 35^a to a certain position corresponding to the speed of 80 revolutions of the record tablet. This position may be marked on the segment 36. In a similar way the position of the pointer 35^a can be ascertained for other speeds. Now when a performance is to take place, the first that can be done is, to bring the loose pointer 37 to the position on the segment corresponding with the speed the driving mechanisms are desired to run. By this means it is possible to easily find the correct position of the pointer 35^a when during the performance a disturbance has taken place. Normally the brake levers 31 are held by the screws 33 and 33^a respectively in such position that both driving mechanisms run synchronously. Now should it happen, that on the record the needle jumps into a wrong convolution of the phonic line, so that the pictures exhibited no longer agree with the words or sounds, it is the task of the operator to alter the speed of the driving mechanism of the kinematograph in such a way that the pictures correspond to the words or sounds heard from the talking machine. When this is accomplished, it is now his task to regulate the running of the driving mechanism of the kinematograph to its former speed, so as to obtain synchronism of the two apparatus. This regulation is to be carried out by observing the pointers 35^a and 37, since when first changing the speed of the driving mechanism of the kinematograph the pointer 35^a moved away from the pointer 37, but when synchronism again is desired the pointer 35^a must be returned, to again coincide with the pointer 37, and this is done by turning the screw 33^a. The finishing part of the adjustment is carried out by observing the pointer 29^a and the proper line of division of the dial on the disk 29 that should coincide with the pointer. When the desired synchronism of the two apparatus has been obtained, no matter whether it is after starting the two apparatus or whether after a disturbance has been rectified, it is necessary to uphold the synchronous working of the two driving mechanisms. This is done advantageously by connecting the two driving mechanisms by a clutch that can be thrown into and out of gear. In the construction shown in Fig. 1 a clutch mechanism of this description has been made use of. By moving the lever 24 to the right the clutch member 23^a is moved to the left, thus throwing it into gear with the clutch member 23, whereupon the operator no longer need watch the apparatus,

since there is no fear of their losing their synchronism, until some distinctive disturbance takes place in the performance. Then the operator must throw the clutch out of gear and regulate as described above.

Any kind of motors or driving means operated by hand or mechanically can be used instead of the spring motors shown.

In the modification shown in Fig. 2 the means to positively connect the two apparatus is combined with the regulating means to form a compound mechanism. The motor 38 for driving the record carrier 39 is used to rotate the brushes 40 of a current distributor 41 of known construction, for distributing the current for an electromotor 42, which operates the kinematograph by the gearing hereinafter described. The motor 42 is provided with a shaft 43 having keyed thereto four gear wheels 44, 45, 46 and 47. The gear-wheel 44 meshes with a gear-wheel 48 preferably of equal size fast on a hollow shaft 49, slidably arranged on the driving shaft 50 of the kinematograph 51. This hollow shaft which also carries two more gear-wheels 52 and 53, adapted to mesh with the gear wheels 45 and 46 respectively, can be moved along the shaft 50 by a hand lever 54, to throw the gearing 44, 48 forming the positive connection between the apparatus spoken of above, out of gear and to either throw the gears 45 and 52 or 46 and 53 into gear as requirement demands, the gears 45 and 52 being constructed in such proportion as to allow the kinematograph 51 to run with a high speed and the gears 46 and 53 being so constructed as to drive the kinematograph slowly. The gear 47 is of conical shape and meshes with a conical gear 55 integral with a tubular shaft 56 carrying at its end the disk 57 and surrounding a shaft 58, which at one end is provided with the pointer 57^a and at the other end with a conical gear 59 in mesh with another conical gear 60 fastened to the shaft 50. The disk 57 and the pointer 57^a constitute the speed indicating devices and correspond with 29 and 29^a of Fig. 1. The gears 48 and 44 constitute the positive connection for the two apparatus that can be thrown out of gear by the hand lever 54 and the gears 45, 52 and 46, 53 constitute the speed regulating means spoken of above. When a disturbance in the performance takes place as a consequence of the needle jumping into a wrong convolution of the phonic line or of a number of pictures in the film of the kinematograph having been omitted, the hand lever 54 is moved to one side, so as to throw the gears 48, 44 out of mesh and either of the gears 52, 45 or 53, 46 into gear. The kinematograph thereupon will change its speed and in a short time sounds and pictures will again correspond. As soon as this takes place the hand-lever is moved to its former position

to allow the kinematograph again to be driven by the gearing 44, 48.

The gears 45, 52 and 46, 53 may be replaced by conical pulleys 45^a, 52^a and 46^a, 53^a as shown in Fig. 3, which preferably may be provided with a central cylindrical part, so as not to change the speed until the gear-wheel 48 is disengaged from the gear 44. The belt shifter 61 is combined with the hand lever 54 that is designed to move the gear 48 axially on the shaft 50. In other respects the construction may be the same as shown in Fig. 2.

Instead of using separate motors for the two apparatus, these may be driven by a single motor, thus for instance in Fig. 2, the motor 42 may be used to directly operate the talking-machine, omitting the motor 38 and current distributing device 40, 41 as shown for an example in Fig. 3. In both cases the equal running as well as the unequal running of the apparatus can be observed by the pointer 57^a and disk 57.

Should it be desired, the gears 44 and 48 may be omitted altogether in the modification shown in Fig. 3, the center part of the conical pulleys constituting the positive connection spoken of above. In this case the belt 62 may be held in the central position by any suitable means.

Other means to regulate the speed of the apparatus may be designed to substitute those shown.

In the modification shown in Fig. 4 the means for positively connecting moving parts between the two apparatus is combined with the speed regulating means. The shaft 63 of the motor 64 driving the record carrier 65 of the talking machine is provided with a conical driving gear 66 in mesh with a conical gear 67 fastened to disk 69 which is loose on a suitably journaled shaft 68. This disk 69 is provided with a number of teeth 70 and serves both as an indicating disk, similar to the disk 29 shown in Fig. 1, and as a clutch member similar to 23. At a short distance from this disk 69 there is a tubular slide 71 axially movable on the shaft 68 carrying a tongue 72 at one end and engaging a hand lever 73, by the aid of which the tongue 72 may be brought in or out of gear with the teeth 70 on the disk 69. The tongue serves both as pointer similar to 29^a and also as clutch member similar to 23^a of Fig. 1. It will be clearly understood, that the tubular slide 71 rotates together with the shaft 68. The kinematograph 73¹ is driven by an electromotor 74, the speed of which may be regulated by resistances 75 that are cut out of or introduced into the circuit in a known manner. In the modification shown the shaft 68 is rotated by means of conical gears 76, 77, 78 and intermediate shafts 79 and 80 by the motor 74, however it may be also driven directly from this motor or by other

intermediate gearings. The disk 69 will be provided with dials similar to the disk 29 of Fig. 1 and the proper line of division will be normally opposite the pointer or clutch member 72. When not in gear this member will move away from the said position with respect to the said division line as soon as the apparatus run at different speeds. At the moment synchronism is again obtained the speed must be regulated in such way that the pointer 72 will continuously remain in its position with regard to the disk 69.

I claim:

1. A device for controlling the operation of two reproducing apparatus comprising driving mechanisms for the two apparatus, means for indicating the relative speed of said apparatus, regulating means for controlling the relative speed of the driving mechanisms and means for normally connecting said driving mechanisms.

2. A device for controlling the operation of two reproducing apparatus comprising driving mechanisms for the two apparatus, clutch members between said driving mechanisms, regulating means for the latter, and means for indicating the relative speed of said apparatus.

3. A device for controlling the operation of two reproducing apparatus comprising driving mechanisms for the two apparatus, means for indicating the relative speed of said apparatus, regulating means for the

driving mechanisms, and means for positively connecting the latter.

4. A device for controlling the operation of two reproducing apparatus comprising two independent driving mechanisms, one for each apparatus, means for positively connecting and disconnecting said driving mechanisms, and regulating means to control the operation of one of the driving mechanisms when disconnected from the other.

5. A device for controlling the operation of two reproducing apparatus comprising driving mechanisms for the two apparatus, means for indicating the relative speed of the operating shafts of said apparatus, regulating means for controlling the relative speed of said operating shafts, and means for normally connecting said driving mechanisms.

6. A device for controlling the operation of two reproducing apparatus comprising driving mechanisms for the two apparatus, means for indicating the relative speed of the operating shafts of said apparatus, regulating means for controlling the relative speed of said operating shafts, and means for positively connecting said driving mechanisms.

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