

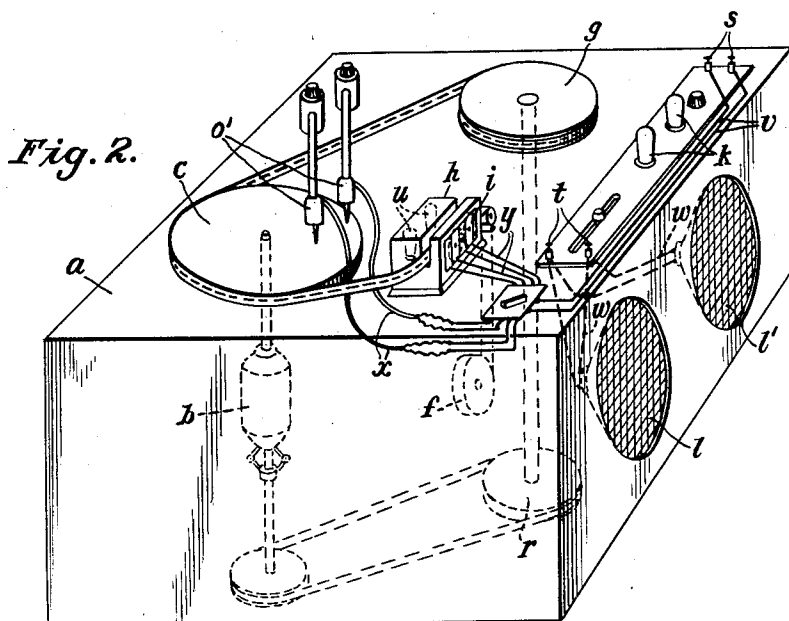
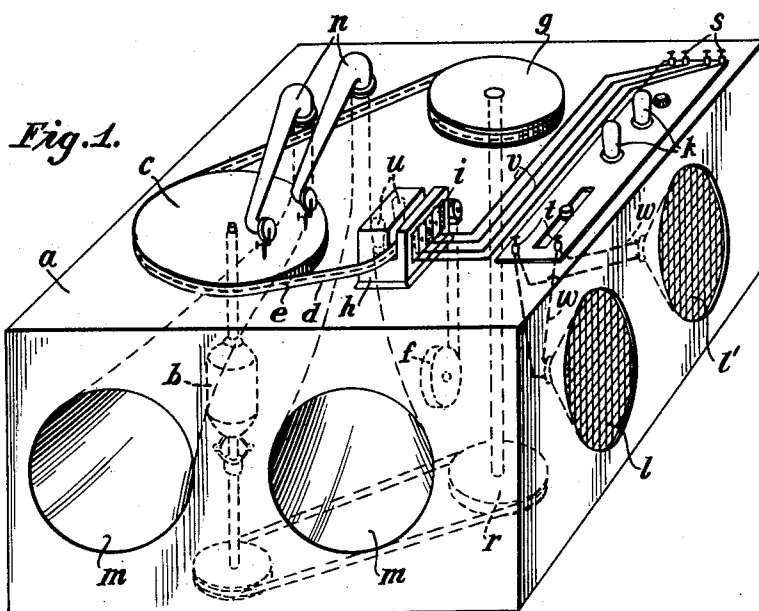
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SOUND REPRODUCING APPARATUS

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SOUND REPRODUCING APPARATUS

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4 Claims. (Cl. 179—100.1)

My invention relates to sound reproducing apparatus and it is an object of my invention to combine a musical reproducing instrument of any kind, such as a talking machine, with an apparatus having a sound-reproducing or phonograph record, such as a film, a band, a wire, etc. This application is a division of my copending application Serial No. 229,758, filed October 29th, 1927, Patent No. 1,877,731, September 13, 1932.

To this end I so design the combined unit, to wit, the normal musical reproducing instrument and the apparatus that the driving mechanism of the reproducing instrument will operate the phonograph record.

My invention is distinguished from the existing art in that the drive of the musical reproducing instrument, synchronizing means, such as a slip clutch, and other supplemental parts, if any, cooperate in the operation of the apparatus, and the combined unit is controlled by a single governor.

In this manner, I may combine the performance of the phonograph record with that of the musical reproducing instrument, for instance, I may accompany a song on the record with music on the reproducing instrument, etc.

In the accompanying drawing, I have shown in perspective two apparatus embodying my invention, by way of example.

In the drawing

Fig. 1 shows an apparatus with sound passages for its talking machine and the film-scanning means,

Fig. 2 shows an apparatus with loudspeakers for both units.

Referring now to the drawing, and first to Fig. 1, *a* is the casing of a normal talking machine, *o*, *o* are its sound boxes, and *n*, *n* are its sound arms. Two arms *n*, each with a sound box *o*, are shown. Their needles engage the same groove of the talking-machine record at a short distance from each other, for improving the reproduction. *mm* are the sound passages, *c* is the turntable of the talking machine, *b* is the motor for rotating it. The turntable is adapted to receive the usual grooved record and equipped with sprocket teeth on its edge, *d* is a flexible sound record or film on the plate which is perforated at its centre, *e*, *f* is a supply reel from which the film *d* is wound by the rotation of the plate *c*, *g* is a reel on which the film *d* is wound, *r* is a slip clutch by which the reel *g* is actuated from the motor *b*. The slip clutch which may be of any suitable type and is not shown in detail, makes up for the variations in the effective

diameter of the reel *g*. The film *d* is of the type on which the sound is recorded by variations in light intensity, which variations are transformed into current variations by means of a photoelectrical cell, *h* is an apparatus of known type for scanning the sound record on the film *d*, which is arranged intermediate the turntable *c* and the reel *f*, *u* are incandescent lamps for illuminating the photo-electrical cells *i* through the film *d*, and *k* is an amplifier, *v* are wires connecting the cells *i* to terminals *s* on the amplifier, and *w* are wires connecting terminals *t* on the amplifier to two loud speakers *l* and *l'*.

The intensity variations in the photo-electric cells *i* of the scanning disk *h* influence the current of a battery, not shown, and the variations of the current are amplified by the amplifier *k* which may be of the multi-valve type. The loud speakers *l*, *l'* may be built in in the side wall of the casing *a*.

An arrangement of this type may not only be used for reproducing the records of a record plate, a record cylinder, or the film *d*, separately, but it is also possible to combine the performance of the plate or the cylinder with that of the film *d*. In this manner, as mentioned, a song plate may be accompanied by the music from the film *d*, or vice versa, or any other melodramatic accompaniment may be given.

An apparatus for the separate or simultaneous operation of the turntable *c* and the film *d* is shown in Fig. 2.

This apparatus is similar to the one illustrated in Fig. 1 as to its general arrangement, and identical parts have been designated by the same reference numerals.

Here, however, the sound boxes *o*, *o'* have been replaced by electrical pick-ups *o'*, *o'* and the sound arms *n* and passages *m* are dispensed with, only the loud speakers *l*, *l'* being provided. *p* is a switch, *x*, *x* are wires connecting the switch to the pick-ups *o'*, *o'*, *y*, *y* are wires connecting the switch to the cells *i* of the scanning device *h*, and *v*, *v* are the wires connecting it to the terminals *s*, *s*. By means of the switch, the pick-ups are connected to the loud speakers *l*, *l'*, and so are the cells *i*. In this manner, the records on the turntable *c* and on the film *d* may be reproduced separately or together, as desired.

Any type of flexible record may be provided instead of the film *d*, such as bands, wires and the like of magnetizable material on which the sound impulses are recorded by electromagnetic means.

The advantage of my invention is that the

5 talking machine or the like is not interfered with as to its normal operation by the scanning device *h''*, and preferably my appliance is so designed as to be fitted to existing machines or instruments, such as talking machines, and operated by the driving mechanism etc. of such machines.

I claim:

10 1. A sound reproducing apparatus comprising a talking machine having a rotatable record carrier, means for driving said carrier and reproducing means for reproducing the sound from a record carried on said carrier, a separate flexible sound record strip, means on said record carrier
15 for engaging and driving said sound record strip and electrical reproducing means for reproducing the sound from said record strip.

20 2. A sound reproducing apparatus comprising a talking machine having a rotatable turntable,

means for driving said turntable, and reproducing means for reproducing the sound from a record carried by said turntable, a separate flexible sound record strip, means on the edge of said turntable to engage and drive said sound record strip and electrical reproducing means for reproducing the sound from said record strip. 80

3. A device as set forth in claim 1 in which is provided an amplifier and means for directing the output of each of said reproducing means into said amplifier. 85

4. In a sound reproducing apparatus, the combination of a flexible sound record with electrical reproducing means therefor synchronously associated with a mechanically grooved sound record and associated reproducing apparatus, and means whereby said reproductions may be effected simultaneously or separately. 90

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