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SYSTEM FOR PRODUCING RECORDS OF SOUNDS ON SENSITIZED TRAVELING FILM BANDS

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Fig. 2.

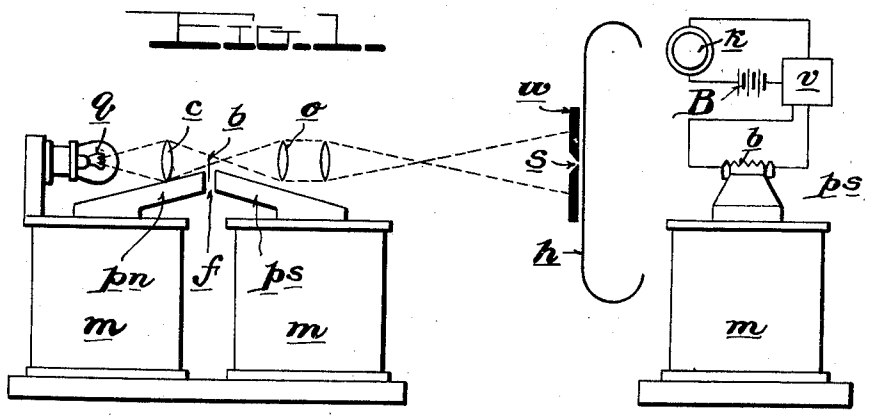


Fig. 3.

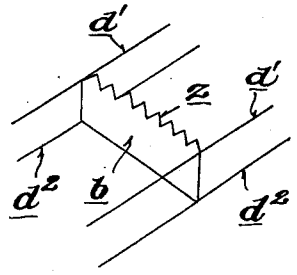
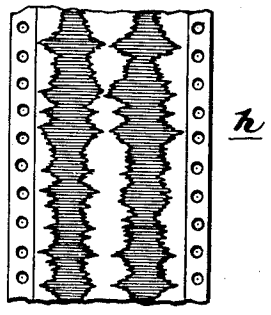


Fig. 4.



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UNITED STATES PATENT OFFICE.

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SYSTEM FOR PRODUCING RECORDS OF SOUNDS ON SENSITIZED TRAVELING FILM BANDS.

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My invention relates to improvements in systems for producing records of sounds on sensitized traveling film bands, and more particularly in systems of the class in which a blind disposed in the path of a beam of light falling on the sensitized film band is adapted to be moved by the sounds for more or less blinding the said beam. The object of the improvements is to provide a system of this type which is very sensitive and in which the oscillations of the electric current caused by the sound act directly on the beam, and with this object in view my invention consists in disposing the blind in a magnetic field and in the electric circuit influenced in accordance with the sounds to be recorded, so that the position of the blind in the said field is varied by the variation of the current flowing in the said circuit.

For the purpose of explaining the invention an example embodying the same has been shown in the accompanying drawing in which the same reference characters have been used in all the views to indicate corresponding parts. In said drawing,

Fig. 1, is an elevation showing my improved system in a diagrammatical way,

Fig. 2 is a side elevation with the light source and optical system removed, and with parts shown diagrammatically.

Fig. 3, is a detail perspective view showing the manner of mounting the blind, and

Fig. 4, shows the record made by means of my improved system.

In the example shown in the figures a blind b provided with an indented margin z is suspended within the narrow gap f of the field poles pn and ps of a magnet m adapted to be uniformly energized during the exposure from a suitable source of electric energy, said blind being disposed in the path of a beam of light rays emanating from a source g and collected by a lense c. At the rear of the blind the diverging rays are made convergent by an object system o throwing a magnified image of the blind b to a slot s made in a partition w provided before a moving film band h. The blind b is included in the circuit of a microphone k, which circuit includes a battery B and an intensifier v. The gap f is very narrow, and the magnetic flux is short and strong. Therefore the lines of force passing between the field poles pn and ps are practically parallel and horizontal. The blind b is made from very thin sheet metal, and it is disposed with its plane vertically and transversely of the magnetic flux. It is supported by means of wires d^1 and d^2 secured one to each corner of the blind and disposed outside the magnetic flux. The said wires are long, and their oscillations may be deadened more or less by cotton. The mass of the blind is so small that it has practically no oscillation of its own.

The sounds to be recorded are made to act on the microphone k, which causes a variation of the current flowing in the microphone circuit, said variation being intensified by the intensifier v. The amplified current flowing through blind b causes the latter to be acted upon by a force which varies directly with the strength of the current and tends to move the blind at right angles to the flux, up or down according as the current flows in one direction or the other. Thus more or less of the light beam will be intercepted by the indented edge of the blind as the latter vibrates in accordance with the sound waves incident on microphone k, and a magnified image of said edge will be shifted relatively to the slot s, varying the image on the film band in exact accordance with the sound to be recorded. By reason of the small dimension of the blind the resistance opposed by the air to the movements of the blind is negligible. The wires d^1 and d^2 insure movements of the blind parallel to its plane, and the blind does not alter its position perpendicular to the magnetic flux. In the operation of the blind there is no objectionable resistance, because the blind has no self-oscillation, and the wires d^1 and d^2 are located outside the magnetic flux so that they are not acted upon by the flux, and their movement may be deadened by cotton. Therefore, the record of the sound produced on the film is sharp, and the reproduction of the sound by means of the film is exact.

As appears from the above description my improved system shows the following important features: In the system no mirror is needed, and the oscillations of the current caused by the sound act directly on the beam of light by means of the electric circuit. In

this respect my improved system is distinguished from other systems in which the sounds act through the intermediary of currents of air on the source of light for varying the intensity thereof, or on mirrors or other means for varying the intensity of the beam of light, the intensity of the action of the light on the film being controlled, in my system, only by the position of the blind. Therefore the record does not consist of shades of varying intensity such as are produced by exposure of varying light intensity, but the record is an image of the different positions of the blind.

I claim:

1. A system for producing sound records, comprising a magnet, a blind made from thin sheet metal and disposed in the magnetic flux of said magnet, an electric circuit responsive to sound including said blind, means for moving a sensitized record member, and means to direct a beam of light against said record member, said blind being located with its margin in the path of said beam, said margin being indented.

2. A system for producing sound records, comprising a magnet having its field poles meeting with a very narrow gap, a blind made from thin sheet metal and disposed in the magnetic flux of said magnet, an electric circuit responsive to sound including said blind, means for moving a sensitized record member, and means to direct a beam of light against said record member, said blind being located with its margin in the path of said beam, said margin being indented.

3. A system for producing sound records, comprising a magnet, a blind exposed to the influence of the magnetic flux of said magnet, an electric circuit responsive to sound including said blind, means for moving a sensitized record member, means to direct a beam of light against said record member, said blind having an indented edge in the path of said beam, and optical means arranged for producing a magnified image of said member on said record blind.

4. A system for producing sound records, comprising in combination a magnet, a blind composed of thin sheet metal supported between the poles of said magnet transversely to the flux thereof so as to be movable in its own plane, a portion of said blind projecting outside of said poles, wires supporting said blind and secured one to each corner, an electric circuit responsive to sound including said blind, means for moving a sensitized record member, means to direct a beam of light over said poles against said record member, said blind being transverse to said beam and having its projecting portion located therein.

5. A system for producing sound records comprising, in combination, a magnet, a blind composed of thin sheet metal movably supported between the poles of said magnet transverse to the flux thereof, a portion of said blind projecting outside of said poles and formed with a serrated edge, an electric circuit responsive to sound including said blind, means for moving a sensitized record member, and means to direct a beam of light over said poles against said record member, said blind being transverse to said beam and having its serrated edge located therein.

In testimony whereof I hereunto affix my signature.

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