

The Phono-Cinematograph

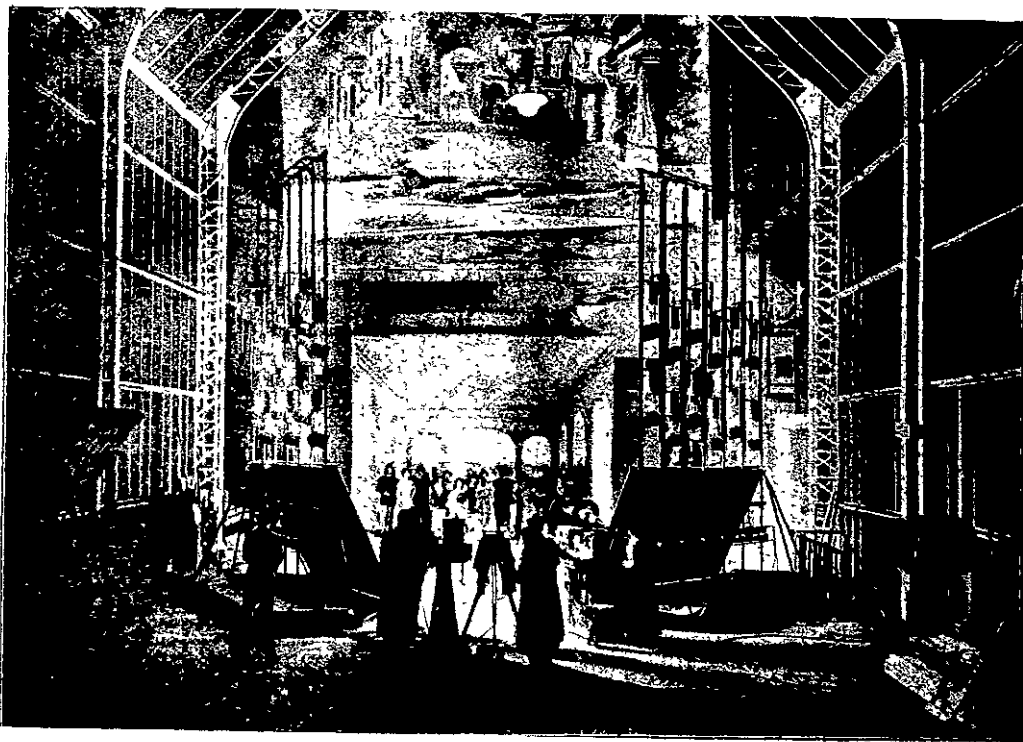
A notable invention which brilliantly fulfils the promise of early days.

THIS combination of the phonograph and the cinematograph has now become a thoroughly practical success. One for the picture and the other for words or sounds, they instantly seize and afterwards reproduce at will living scenes, enabling interesting and useful records to be preserved of a period, an industry, or an art.

If, separately, the phonograph and the cinematograph record interesting events, it is evident that their combination in one apparatus, producing at the same time a living scene and voices of all kinds which accompany it with rigorous exactitude, presents a far greater interest.

We will describe, in the first place, the phonograph which entirely fulfils these conditions.

The Phonograph.—The phonograph of to-day (1907) is constructed exactly on the same principle as the primitive apparatus of Edison dating back to 1877. It comprises: (1) a plastic surface (cylinder or disc) rotated so that every part passes successively below a fine point of agate. It is upon this surface that sounds are registered: (2) a reproducer diaphragm, consisting of a small cylindrical box one of the ends of which is a vibrating membrane supported by the sides of the box, and carrying in its centre a pencil the point of which serves—either to scratch the surface of the “phonogram,” in order to trace thereon a furrow more or less wide and deep, according to the nature and volume of the sound vibrations received by the membrane; or to retrace the furrow without altering it, to operate in an inverse manner upon the membrane, and make it emit the sounds registered previously: (3) a motor mechanism operated by clockwork or a small motor (generally electricity), giving to the phonogram its rotary movement, and to the diaphragm the corresponding movement, so that the combination of these two movements causes the pencil to traverse regularly over the whole surface of the phonogram: (4) a



“TAKING” A SCENE BY PHONOGRAPH AND CINEMATOGRAH IN A THEATRE SPECIALLY DESIGNED FOR THE PURPOSE.

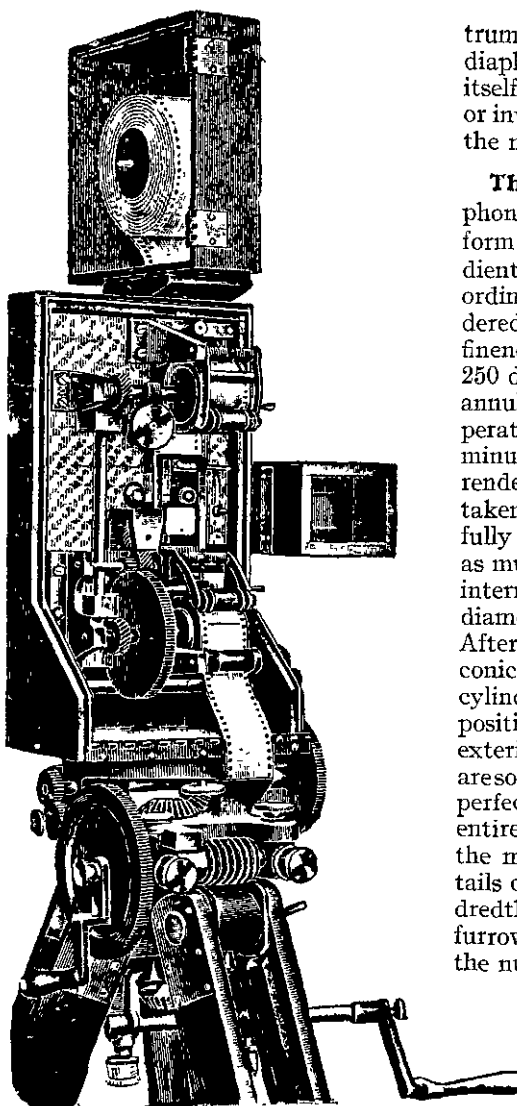


Fig. 2.—CINEMATOGRAPHIC (Rear view).

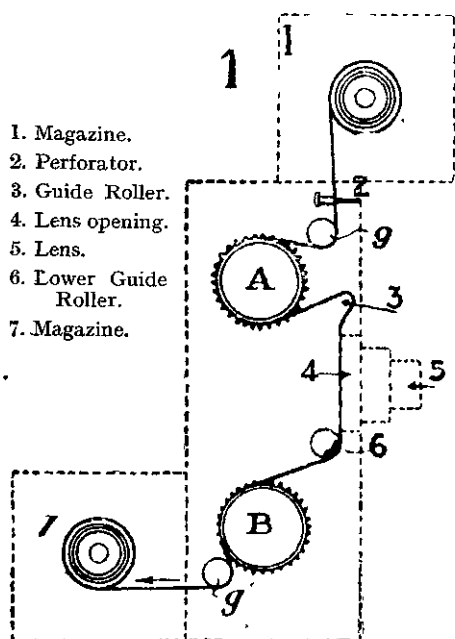


Fig. 1.—CINEMATOGRAPHIC APPARATUS (vertical section).

trumpet mounted above the mouth of the diaphragm, and serving to concentrate upon itself the sounds which it is desired to register, or inversely to amplify the sounds emitted by the membrane when reproducing sounds.

The Phonogram.—For a considerable time phonograms have been made in cylindrical form and of plastic composition, the ingredients of which are principally wax, or more ordinarily stearine. The composition, rendered thoroughly homogeneous and of perfect fineness, melted by a temperature of about 250 degrees, filtered and purified, is run into annular moulds maintained at a lower temperature, and rotated in order to expel the minutest bulbs of air, which would leave holes, rendering the cylinder useless. It is then taken out of the mould, trimmed, cooled carefully to avoid unequal shrinkage, scooped out as much as possible in the intervals between internal ribs, which alone are left to the exact diameter of the mandril of the phonogram. After suitably boring (this mandril is slightly conical to facilitate the introduction of the cylinder and to avoid placing it wrongly in position), it is finally turned and polished exteriorly by a machine (the cutters of which are sometimes of sapphire), and then presents a perfectly cylindrical and smooth surface. The entire perfection of phonograms consists in the minutest exactitude of the smallest details of the impression, because it is by hundredths of a millimetre that the depth of the furrow is measured, and by thousandths that the number of undulations scratched in each centimetre of the furrow is measured; scarcely perceptible, and yet so characteristic that a person can recognise under microscopical examination a special feature, according to the nature of the