



HE general public does not realise the great debt it owes to such scientific pioneers as Maxwell, Hertz, Lorentz, Thomson, and Richardson—men who conducted their research without any monetary motive and with little or no thought to any possible future commercial application of their discoveries.

Through their efforts we came into possession of the electro-magnetic theory which has taught us so much about the electron theory and explained many a baffling phenomenon. Years later the data collected by these men was put to use by other scientists, who, in the process of research and development brought out the forerunner of the present radio valve.

Perhaps no other single achievement in the scientific world has done so much to break down international boundaries and promoted good-feeling throughout the world.

This is true because the radio valve is used not only in broadcasting stations and receiving sets, but also in the short-wave transmitting stations that are used for long-distance radio-telephony. Within the last month telephone service has been inaugurated between Australia and Great Britain. Here we see the result of many years of painstaking research and development work, each scientist doing his bit towards breaking down the great barrier of distance.

This same radio valve is responsible for the fact that telephone conversations over land lines can take place between Auckland and Dunedin in this country, and in the United States between San Francisco and New York, a far greater distance. Such commonplace everyday work, so vital to the business world, would be impossible were it not for this radio valve and its associated pieces of equipment which go to make up the amplifier necessary to bring the voice currents up to sufficient strength to make them audible at the other end of the line. Development work in voice amplification has necessarily reached out and taken in further fields.

FROM THE GRAMOPHONE TO TALKIES

WE see an example of this in the present-day gramophone records which are practically all electrically cut. That is, the artist sings to a regulation broadcasting type

SCIENCE has removed the gag from the screen, broadcasting the application of its entertainers, adding coherence, giving deft, capable touches to the technique of film presentations. It was inevitable that soon or late the cinema play would discover its vocal chords, but there is no doubt that but for the radio valve—marvellous electric bottle which topsy-turveyed established ideas—the talkies might well be less developed than they are. Mr. McCutcheon writes entertainingly on the subject in the article featured below.

CHILD OF RADIO BECOMES FATHER OF THE TALKIES

By
W. A. McCutcheon

microphone which in turn is connected to a group of amplifiers of sufficient power to actuate the cutting mechanism for making the gramophone disc. This permits of quality in reproduction which could not be attained by the old-fashioned large horn. This particular phase of voice amplification, together with that of long-distance telephone amplification, made possible the present-day talkie picture.

It is quite true that several attempts were made years ago to have the gramophone located at the back of the screen and connected

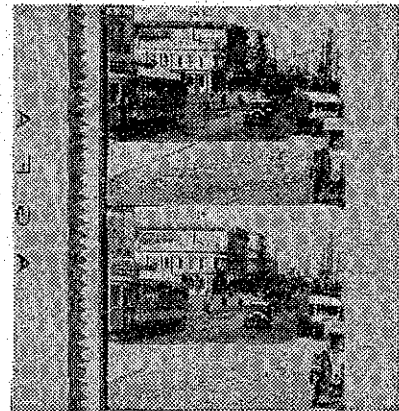


Mr. W. A. McCUTCHEON, director and chief engineer, Western Electric Co. (N.Z.), Ltd.

by a series of belts and pulleys to the projection machine in the booth. Needless to say, such a method was fraught with difficulties on every side, and the results did not warrant going into the talkie field on a commercial basis.

RECORDING FOR THE TALKIES

THE Bell Telephone laboratories, located in New York City, working in conjunction with engineers from the gramophone recording studios, developed a process whereby re-



A strip of talkie film taken in Auckland. The jagged marks on the left-hand side are the sound impressions.

cording on a disc could be done simultaneously and in synchronisation with a motion picture camera located at some distance from the gramophone disc-cutting machines. This made possible the talking picture of to-day in one of its present forms, and in August, 1926 the first practical commercial talking picture theatre opened in New York City.

While this was not the first talking picture theatre to open, it does mark a milestone in the talking picture industry, as, unlike its predecessors, this theatre is still open and running successful talking pictures.

TWO METHODS OF TALKIE REPRODUCTION.

THE disc method of talkie pictures differs considerably from the film sound-track method. In the latter process the sound is photographed on to the edge of the film by an intricate system of valves and amplifiers. Such an equipment may readily be placed in a motor lorry similar to the one you have probably noticed taking sound pictures in New Zealand not many months ago. By this means, items of interest to everyone in the world can be taken in their natural setting and with the corresponding sound.

It is even possible to transmit the picture and its corresponding sound-track over land wires or by means of radio and have it duplicated on a strip of film at the receiving end.

This has been done on a few occasions in an experimental way, and, while the results were not perfect, they justified the experiment, and encouraged the scientists to carry on in this line.

While this is not exactly television, it becomes a close approach to it, inasmuch as the sight and sound are presented before a new audience within two hours of their actual happening. It should not be many more years before the cricket enthusiast of New Zealand can go into a theatre and witness a cricket match being played in good old England.

The radio valve has truly conquered distance and shortened time. It has broken down barriers that have tethered the world since prehistoric times. It has been a great aid in times of war, but by its very elasticity of uses

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