TELEVISOR LETS RADIO FANS "LOOK IN" AS WELL AS LISTEN

John L. Baird of Scotland Demonstrates Apparatus Which Sends and Detects Pictures of Moving Objects

JOHN L. BAIRD, a Scottish inventor and the thirty-six-year-old son of a Presbyterian minister at Helensburgh, near Glasgow, has developed a practical method of transmitting pictures of moving objects by radio.

The company which has acquired the patent rights is now in negotiation with the British postoffice to secure permission for the erection of a broadcasting station. Owing to the fact that the British Broadcasting Company's concession from the postoffice expires on Dec. 31, the new "televisor" is not likely to be offered for public use until the beginning of next year. At present it is believed that the postoffice will take over the broadcasting service next year, and wireless fans in Great Britain will thereafter be able to "look in" as well as to listen in.

Receivers to Be Compact.

Mr. Baird says that his company is already in a position to produce receiving sets for sale at $150 apiece, but that none will be offered until the present negotiations with the postoffice are completed and a broadcasting station is ready for operation. After fourteen years' work in developing his invention he believes that in a year or two it will be possible to reduce the price of receiving sets slightly and also to reduce their size. The set with which he gave a demonstration at his office in the West End of London the other day is much larger than the ordinary receiving set. It is a box about 3 feet by 2 feet by 1 foot in size, with a hood projecting from one side. Inside the hood is a lens in which the transmitted picture is seen. When the television service is working in conjunction with the ordinary broadcasting service under the auspices of the postoffice, as now seems likely, combination receiving sets are to be offered for public use. In these sets a loud speaker is to be fitted inside the hood, and when Sir Harry Lauder is being broadcast it will be possible, by watching the lens inside the hood of the receiving set, to hear him and see him simultaneously.

At the demonstration which he gave recently Mr. Baird talked into the transmitting apparatus in his laboratory while his guests watched the lens inside the hood of a receiving set in the little theatre he has fitted up on the floor below. His voice and the picture of his face come through very clearly. The picture was in black and white, his lips could be seen enunciating each word, and the shadows changed with his changing expression.

Inventor Explains System.

"My 'televisor' is nothing like telephotography," he said afterward. "The transmission of photographs or still pictures onto a plate is no longer a novelty. What my 'televisor' does is to transmit to the human eye living and moving pictures at the instant of their occurrence. The problem which I have had to solve is not only that of converting light into electric waves at the transmitting end and reconverting waves into light at the receiving end—the solution of that problem is nothing new—but also of synchronizing the converting and reconverting processes and of speeding them up so as to give the eye the impression that it is seeing a whole picture instead of a succession of parts. Once the synchronizing and speeding up problems have been solved, we can transmit moving pictures to any distance that wires or wireless will carry. We can focus the lens of our transmitter just as you focus a kodak, so that we can send a close-up of a face or a distant view of a battle in progress. It is all a matter of speed and synchronization in transmitting."

Mr. Baird interrupted his description to give a demonstration of the working of his transmitter, he stood in a flood of light while the disk revolved at a whistling speed. "Stookie Bill" lay on the windowsill at his elbow as he talked. "Stookie Bill" is the head of a ventriloquist's dummy, and its garish likeness has been telegraphed ever since inventors first began developing telephotography. "Stookie Bill" is a sort of mascot among all inventors who work on the problems of picture transmission.

Experiment Covers Fourteen Years.

"There is only one thing which makes the problem of television an extremely difficult one," he said. "That is the speed of signaling which is necessary if you are going to see an event at the actual moment at which it is occurring. The transmitting and receiving mechanisms must not only be so sensitive as to respond to extremely small quantities of light, but they must respond practically instantaneously. This is the great obstacle in all attempts to develop practical television. You have seen at what stage I have arrived in my effort to put television on an efficient commercial basis. It is not yet as nearly perfect as I want it to be, but it is much better than a couple of months ago. Its perfection is now only a matter of time and money, and, for the first time since I began work on it in 1912, I have all the money at my disposal which I need.

"Aside from the speed and synchronization and signaling, the problem of television is simple. The general theory of it is to project a picture onto a light-sensitive cell in a piecemeal fashion. Each of the small areas into which the picture is divided causes the light-sensitive cell to send out an electric current which is proportional to the amount of light in its 'area.' Thus the dim parts of the picture send out a weak current and the bright parts send out a stronger current. At the receiving station these currents control a source of light which is projected onto a screen in exact synchronism with the projection of the picture at the transmitting station, and the process is performed so rapidly that, due to the eye's retention of images, the whole picture appears simultaneously.

"The light-sensitive cell is nothing very novel among inventors. I use only one cell at the transmitting end, and I break up my picture into 'areas' by means of the lenses in the whirling disk. The lenses in the disk focus the 'areas' of the picture, one by one, onto the cell, and when the disk has been whirled once around every 'area' of the picture has been focused consecutively onto the cell.

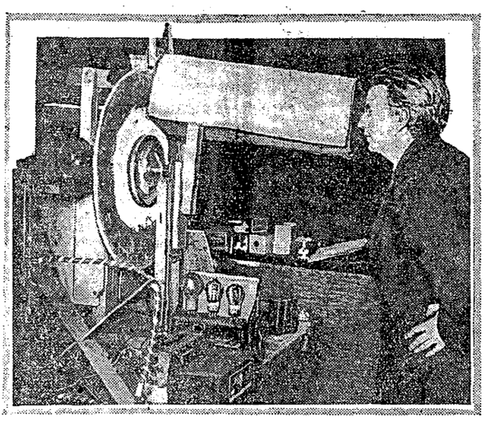
"The cell is connected by vacuum tubes and electric gear to the transmitting apparatus and the wave, when we are transmitting, is continually modulated so as to convey the strength of the light from successive 'areas' of the picture. At the receiving end we have a source of light hose strength is controlled by the transmitted wave. We bring this light to a spot and move it so as to follow exactly the beam which comes through the whirling disk onto the cell at the transmitting end. We then have the picture traced out in light and shade at the receiving end with sufficient quickness so that the whole of it is complete before the eye has had time to lose any of it. To the eye, therefore, the whole picture appears to be projected simultaneously, although, in reality, it is projected piecemeal in successive 'areas.'

Transmission Is Rapid.

"When we transmit a still picture the disk is whirled only once, but when we transmit the picture of a moving object the disk is kept whirling and the successive pictures are traced out at the receiving end. All of this is comparatively simple, except the matter of speed and synchronization. Take the case of transmitting a still picture. If the picture is to appear as a whole at the receiving end, its last 'area' must be transmitted before its first 'area' has faded from the eye, and this in actual practice means that all of it, every 'area' of it, must be completed in less than a tenth of a second. Unless we can complete the picture in this almost instantaneous time, television by my method or, as far as I know, by any known method, is of no use, for the eye will have lost the first 'areas' by the time the last 'areas' are coming through.

"It is simple enough merely to transmit the 'areas,' but you must remember that we have to transmit them ultimately to the human eye. For instance, let us say that we take as much as half a second to send a picture of my face. By the time the light-sensitive cell is transmitting the light values of my chin the eyes which are watching the screen at the receiving end will have lost the light values of my hair, and the result will be that, although our transmitting method in itself may be perfect, the eyes at the receiving end will retain no image at all. We must be able to transmit all the 'areas' of my face within a tenth of a second if the eyes at the receiving end are to retain an image of my face as a whole. That is the great obstacle in practical television. Once we have succeeded in overcoming that obstacle, we can transmit moving pictures as easily as the cinema does. Having given the eye at the receiving end one complete picture in a tenth of a second, we can give it another complete picture in the next tenth of a second by merely keeping the disk whirling at the transmitting end. This is the ordinary cinema principle. The cinema in operation, as everybody knows, consists of an extremely rapid succession of still pictures.

"Practical television, therefore, boils down to the very rapid transmission of light dots and a synchronizing mechanism. Suppose we want to transmit a moving picture of an object, say two inches square. We have to transmit at least ten complete pictures of it every second, and by the most conservative estimate this requires the transmission of about 25,000 light dots a second. This is what my mechanism does. For my light at the receiving end I use a glow lamp, and for my synchronizing mechanism I move the spot of light across the screen by means of a slot and a rotating spiral. The result you have seen in the theatre downstairs."



Wide World.

John L. Baird of Scotland, Who Has Invented a System for Transmitting Pictures of Moving Objects by Radio. He Is Shown Here Looking Into the Machine Which He Has Named "The Televisor."

WGN TO BROADCAST DERBY AND AUTO RACE

TWO of the most important sporting events in the country will be broadcast next month, when the Kentucky Derby, on May 15, and the Indianapolis automobile race on May 31, are described to listeners direct from the tracks through WGN, Chicago.

This will be the second year that WGN has essayed to broadcast America's turf classic, run at Churchill Downs, Louisville, Ky. The announcer, Quinn Ryan, will be assisted by French Lane and Harvey Woodruff, racing experts, also Jack Dempsey, veteran clocker.

At Indianapolis Mr. Ryan will give a running description of the 500-mile automobile race. Open microphones placed near the track bring the roar of the motors to the listeners. It will be the third time that WGN has handled the affair, and many famous motoring men will be at the microphone to give their views during the progress of the race.

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Norman Curtis, pianist, will be heard in a half-hour recital from WEAF this afternoon at 5:30 o'clock, Eastern Daylight Saving Time.