

VOICE AND ACTION ALIKE REPRODUCED

Sight and Sound Recorded
on Common Film.

INVENTOR GIVES DETAILS

Polish Scientist Tells How He
Achieved Seeming Miracle.
Years Spent in Work.

BY JOS. TYKOCINSKI TYKOCINER.
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lished by Arrangement.)

CHAMPAIGN, Ill., July 30.—(Special.)—At the present moment, after many years of experimenting and as a result of 10 months' research work at the University of Illinois, the apparatus is completed for the taking of moving pictures simultaneously with photographing the speech of the acting persons.

This model is provided with a mercury arc of special construction. The intensity of light of this source is made to vary in accordance with the speech of the acting person. The light from the lamp is focused upon the moving film by a sound recording objective. The sound record is a narrow band of varying transparency running along the edge of the film. In fixed relation to this record the pictures are distributed along the film, so that always the same distance separates every picture from the corresponding place of the sound record. In this way synchronism of visual and sound impression is insured with absolute accuracy.

Years Spent Experimenting.

For the reproduction of the sound record a photoelectric cell is applied of the type developed by Professor Jacob Kunz of the University of Illinois. It consists of a glass bulb having two electrodes, one connected to a layer of photoelectrically sensitive material distributed on the inside wall of the bulb, the other to a ring fixed in the center of the bulb. Light from a lamp transmitted through the sound record into the bulb causes electric charges (electrons) to be expelled from the atoms of the light sensitive layer.

The number of electrons leaving the sensitive surface follows strictly the amount of light absorbed by the layer. Thus the variations of light caused by the sound record are transformed into variations of electricity flowing in a circuit. After proper amplification of the varying electric currents they are transformed into sound waves by means of loud speaking telephones.

Phone Proves Inspiration.

When at school 36 years ago I was very much interested in phonographs and in telephone receivers and was struck with the marvelous working of the telephone compared with the indistinct reproduction of speech by phonographs. It occurred to me that the way of making a perfect phonograph would be to discard the mechanical reproduction of sound and to do it somehow electrically. Since then my thoughts were preoccupied searching for such a method.

In 1885 I decided to leave altogether the commercial career I started and to enter the field of electrical engineering. I left Poland for America with the plan to work as apprentice in workshops during the day and to take electrical courses in the evenings. During my passage from Poland to New York in March, 1896, I conceived the idea of a new phonograph. According to that invention the membrane of a telephone receiver which changes the intensity of a source of light focused upon a moving photographic film.

Lack of Funds Drawback.

As to the reproduction of sound from such a record, it was clear to me then that any device which was able to transform the energy of light into electric currents would serve the purpose. I had only to pass a ray of light coming from a lamp through the record and transmit the fluctuating ray into such a device. I knew the wonderful properties of crystalline selenium to change its electrical resistance under the influence of light, and the whole problem seemed to be solved. I imagined that with a few hundred dollars I could build a new phonograph. But it was easier to conceive the idea and to work out all phases of the scheme than to get anybody sufficiently interested to give money for the purpose. I had no acquaintances in engineering circles, but I found a friend who loaned me \$50 to start the experiment. Early in 1897 I moved from Newark, N. J., where I was engaged in a workshop, to New York.

Strolling through the business center on Broadway I came across a large sign inviting to see the latest wonder, the biograph. I walked in and saw projected upon the screen athletic, military and simple dramatic scenes. It was the first time I saw moving pictures. In a dark room marching soldiers were seen on the wall, performing movements under command of officers. No sound was heard other than the clicking noise of the projecting machine.

Silent Show Unnatural. I was impressed by the technical achievement, but the absence of sound made the show unnatural, and especially the mute dramatic scenes seemed to me unendurable. The necessity of sound and especially speech in addition to the visual illusion was so manifest that I could not help associating the working of my new phonograph combined with the projection of moving pictures.

While returning uptown in the rattling elevated railroad, I had ready in my mind a scheme of photographing sound at the same time with moving pictures on a common film and reproducing the sound simultaneously with projecting the pictures upon a screen.

I constructed two experimental models of the sound recording camera. In the first the sound was controlling the pressure of a gas flame in a lantern in such a way that the image of a narrow illum-



LEFT TO RIGHT, AROUND THE TABLE, MAJOR-GENERAL BREWSTER, MAJOR-GENERAL WILLIAM IRELAND, MAJOR-GENERAL J. F. DICKMAN, MAJOR-GENERAL H. P. MCCAIN, BRIGADIER-GENERAL E. HINDS AND MAJOR R. JONES.

This photo will interest every army officer in the United States. These men seated around the table are considering the status of every officer in the army aside from General Pershing and some second lieutenants. They will honorably discharge about 2500 officers of all rank, to bring the numerical strength within the limits of the appropriation bill.

nated window closed by a milky glass could be photographed on a moving sensitive plate. In the second model the light was transmitted through a narrow stationary slot and then through the opening of a vibrating shutter attached to the diaphragm of a telephone receiver.

Upheaval Changes Plans.

The political upheaval in 1917 and the social revolution in 1918 changed entirely the situation. In the fall of 1918 I returned to my home country and started research work in Warsaw, but soon a political upheaval took place in Poland, bringing at last the long awaited independence to my country. Convinced of the economic and political importance of radiotelegraphy for Poland, I brought, early in 1919, before the newly formed Polish ministry of post and telegraphs plans of a direct (4000 miles) radio communication with the United States.

After eight months of work as an expert for the ministry, I returned to my problem. Unfortunately, unsettled conditions there did not warrant at that time the possibility of research work under favorable circumstances, and I left Poland for America. After a year's work at the Westinghouse Electric & Manufacturing company's research laboratory, I was engaged in 1921 by the engineering experiment station of the University of Illinois. And it was at this great institution that I was given a chance to work on my inventions.

Pistol Shot Ends Game

Diamond Struggle Is Forgotten
When Player Falls Dead.

FOLLANSBEE, W. Va., July 30.—A pistol shot halted a red-hot baseball game here today between Follansbee and Weirton, and close to 4000 persons temporarily forgot the diamond struggle when John J. Kallapka, 23 years old, fell dead with a bullet in his heart.

Louis Olivero, 45, pistol in hand, walked 15 feet to his victim, then turned and shouted:

"My God! I've shot the wrong man!"

At the police station the prisoner said he had shot at Samuel Basil, brother-in-law of Kallapka. They had a quarrel a few days ago. Kallapka closely resembled Basil.

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GENERAL WU ORDERED TO
REPEL INVASION.

Attempt to Recover Pekin-Hankow Railway Rolling Stock Is Suspected.

BY CHARLES DAILEY.
(Copyright, 1922, by the Chicago Tribune. By Chicago Tribune Leased Wire.)

SHAN HAI KWAN, July 30.—A secret agent of General Wu Pei Fu sent into Manchuria finds that General Chang Tso Lin is making extensive hostile preparations at his post outside of the great wall, having increased his troops there by a brigade of infantry and artillery. General Wu Tao has been placed in command with orders to repel any effort to recover railway stock or an invasion by Chinese troops. There is reason to believe that these activities are the result of an alliance with certain Yang Tse Tschuns with the intention of restoring Tuan Chi Jui, the former Anfu leader, to power, and then negotiating with Dr. Sun Yat Sen, whose forces are about to engage in a decisive battle with General Cheng Hung Ming in northern Kwang Tung.

As a result General Wu has been compelled to renew military preparations on an active scale. These preparations are visible in eastern Chihli within 30 miles of Shan Hai Kwan, and also at Pao Ting, Fu Luang and Kifeng.

Town to Be Repainted.

MARSHFIELD, Or., July 30.—(Special.)—Wedderburn, the small town on Rogue river owned by the Macleay estate, is to be repainted this summer and will take a thorough coat of white, with red trimmings. The town is on the north side of the Rogue's mouth and nearly opposite to Gold Beach, where the inhabitants can look across and envy the neat appearance of the neighboring landscape.

Maryland Lawyer Dead.

BALTIMORE, July 30.—Roger W. Cull, a leader of the Maryland bar and who for many years exerted a powerful influence as a reformer in Maryland politics, died today, aged 72.

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Colonel Arthur P. S. Hyde, 22 Years in Service, Feels Call to Church Again.

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SUN'S TROOPS ATTACKING

DEPOSED PRESIDENT HOPES
TO WIN BACK JOB.

Pincer Movement Begun Against
Chen's Lines, Which Extend
Into Shichow.

CANTON, China, July 30.—(By the Associated Press.)—Heavy reinforcements for the army of Sun Yat Sen, deposed president of South China, coming down out of the north, launched an attack in force on Chen Ching-Ming's lines in Shichow, about 130 miles north of here today.

Another wing of Sun's army is attempting to take Chen's troops in the rear 30 miles further south. The source of Sun Yat Sen's recent confident assertions that he soon would be restored to power at Canton, in whose harbor he is virtually interned at present aboard his cruiser Wingfung, was revealed with the drive his leaders in the north launched today against Chen Ching-Ming.

Sun reiterated that he would regain control when his divisions, sent into Kiangsi province several months ago in a campaign towards the Yanktee valley, returned to turn the tables on Chen Ching-Ming, the man who dragged him from the presidential chair of South China.

Five weeks passed and but little encouragement in the form of troops appeared out of the north to bolster Sun's waning cause. His enemies said his Kiangsi forces were scattered, hopelessly out of hand, dissolved over the countryside, looting like brigands.

Sun, however, refused to lose heart. He said his army would come back and today it came in force. A total of 25,000 troops were said to be marching under Sun's banner in the double attack launched at Chen's lines near Shichow and Chen has 20,000 with which to meet the onslaught there.

Besides the frontal attack at Shichow, Sun's generals have rushed one division southward in the hope that they can cut Chen's line of communications with Canton about 100 miles north of the latter city.

Chen is said to be reluctant to send further reinforcements to his Shichow front, fearing that weak-

Typoid Epidemic Feared.

MARSHFIELD, Or., July 30.—(Special.)—A typhoid fever epidemic is feared at Fairview, a valley settlement, 20 miles from this city, where three cases have occurred in the past month. Miss Myrtle Neely, a school teacher, was the first victim and Russell Sage the second, while George Bonham is the third to be stricken. Miss Neely is recovering, but Russell Sage is very ill. So far as known the cause of the outbreak has not been located, although the wells are suspected, as the dry season has lowered the water in most of them.

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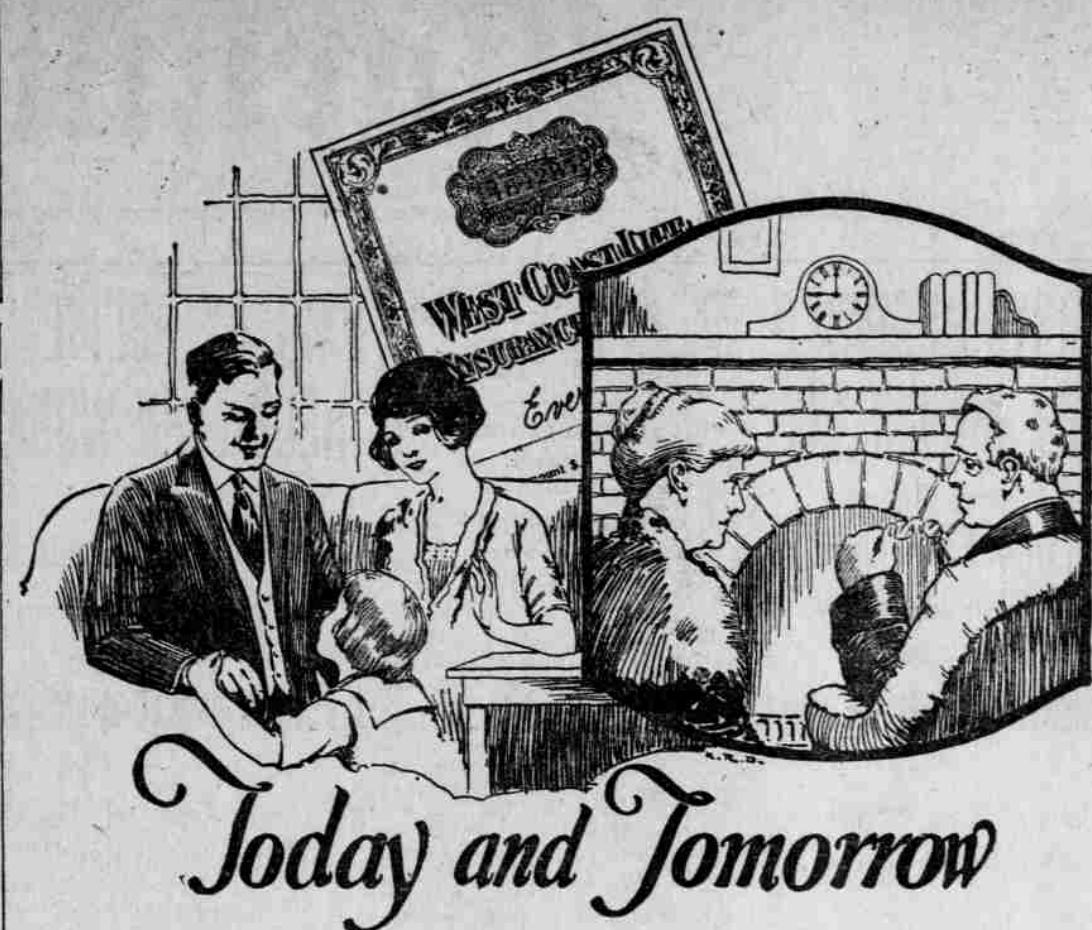
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ending of his forces around Canton will leave that city an easy prey for Sun's navy and land troops there.

Ex-Bartender Drinks Alcohol.

MARSHFIELD, Or., July 30.—(Special.)—G. Nesbitt, an old-time bartender, had four ounces of denatured alcohol left of eight he bought at a local drug store when Constable Goodman found him in a helpless condition. Nesbitt was put to bed with the expectation that he would likely be a candidate for the coroner. The next morning he was up bright and early, and wanted another eight-ounce bottle of the same stuff.

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