PICTURES SENT BY WIRE

Herr Szczepanik's Wonderful Invention Explained in Detail.

FORMS AND COLORS ARE TRANSMITTED

An Apparatus by Which Scenes Can Be Reproduced Hundreds of Miles Away from Where They Are Being Enacted.

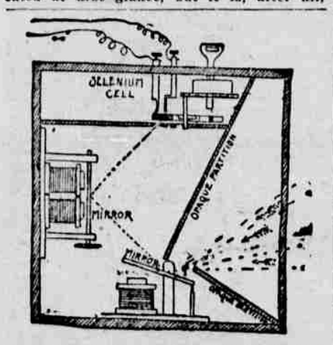
A poor Galician school teacher is reported to have solved a problem over which many leading scientists have labored in vain for years. It is announced that he has perfected an apparatus which will not only transmit pictures by wire, but which will transmit moving images in all of their natural colors. That is, the apparatus is so all-sufficient in operation that if a man were to bow to the transmitter in New York, his image in the act of bowing would be reproduced on a screen in Chicago, or in any other city to which the line might extend. His facial expression, his clothes, his very wink, would be accurately transmitted. Indeed, it would seem that at last we are to be able to see by wire, and a detailed description of the apparatus shows that the performance is, after all, a very simple one.

An English patent attorney says that Herr Szczepanik, the inventor of the process, has been offered over $1,000,000 for the right to exhibit the apparatus in the Paris exhibition of 1900. It is also said that the inventor perfected his theory of how images and colors could be sent by wire in one night. This is indeed wonderful, in view of the facts that Alexander Graham Bell has been at work on a similar process ever since he perfected the telephone, and that Amsturz four years ago published the results of his very conclusive researches in the field of visual telegraphy. However, the cardinal claim made for the new invention is that moving images may really be seen in a glass hundreds of miles away from the initial point of transmission, and that their colors are also reproduced very naturally. It really partakes of the spirit of that wonderful mirror of fairyland, which had to be breathed upon merely in order to produce any wished-for scene. And the second part of the proposition seems to contain the germ of an idea for photographing in colors.

THE REPRODUCING APPARATUS AT WORK.

THE MAGICAL MIRRORS.

The process appears to be very complicated at first glance, but it is, after all, quite simple. The inventor, in order to prepare his images for transmission, found it necessary to split or break them up into series of dots. He accomplished this in a peculiar manner. He procured a small mirror and blackened its surface with an opague substance. He then scratched on it rows of lines running generally in the same direction, but not quite parallel. The lines were cut with a needle point and exposed the reflecting surface of the mirror along each line. They were close together and when the mirror was allowed to reflect an object it would do so only along these lines. Another plate was prepared upon which similar lines were drawn, only they were made to extend crosswise to those on the first mirror. Now, if a large beam of sunlight were allowed to shine against the first mirror, and then to be reflected off against a wall, the light would be divided into a series of lines of light. Then, if before hitting the wall, the lines of light were allowed to strike the crosswise lines of the second mirror, the result, when the light finally struck the wall, would be rows of dots of light, because when the lines of the first mirror struck the lines of the second the beams of light would be reflected only where the lines intersected one another. If, while this broken-up beam of light was shining on the wall the two plates were to be slightly moved backward and forward, the angle of reflection would change, as would also the places of intersection of the lines on the plates, and the consequence would be that the dots on the wall would go dancing up and down and about in all directions within a small area.



APPARATUS FOR TRANSMITTING PICTURES BY WIRE.

An arrangement of mirrors, similar in principle to the above, is made to receive the images which are to be transmitted by wire. In one side of the transmitter case is a narrow horizontal slit. Directly back of this slit or opening is a mirror with lines cut on it as in the first mirror described above. Just above this mirror is another mirror, the lines on which are crosswise to the lines on No. 1. By means of magnets and springs these mirrors are kept constantly oscillating, or moving, in all directions. The plane of reflection, in short, is being rapidly and constantly changed. If a man were to stand in front of the opening in the box the mirror behind the slit, as it danced up and down, would, so to speak, reflect him successively from head to foot and from foot to head, and crosswise and obliquely, and in every other direction possible, as the glass turned or oscillated about. This constantly changing reflection of the man would be passed on to the other mirror, which hangs just above the first. This second mirror is also kept moving about, or changing the plane of its reflection. The moving reflection of the man in the first mirror was, as has been stated, broken up into lines, and when it struck the crosslines of the second mirror it necessarily became dots, so that a constantly changing series of dots of light, showing the reflection of the man outside, is now projected into the upper part of the box or transmitter. Of course, all the colors of his costume are reflected, as well as the shape of his body.

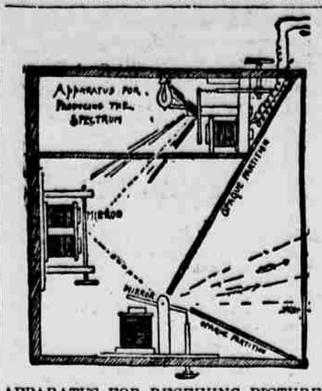
COLORS IN ELECTRIC CURRENTS.

In the top of the box, behind a small partition, is a resistance cell or plate made of selenium. Selenium is a very sensitive substance. If a current of electricity is sent through it it will resist the passage of the current, and cut it down, according to the temperature and the light in which it may happen to be. For instance, if an electric current is passing through a piece of selenium while a red light is shining on it, the quantity of current which will finally get through will be very different from what it would be if the selenium were to be placed in blue light. This very sensitive characteristic of selenium is taken advantage of to transmit pictures by wire. The dots of light, which really form the image to be transmitted, are allowed to play through a narrow slit in the partition against the selenium cell in the top of the box. The selenium is part of the circuit or wire through which the picture is to be transmitted. This circuit may, for all practical purposes, be hundreds of miles long. An electric current is made to flow through it, and, consequently, through the selenium. Now the reflection of the man outside the box, with all the colors of his costume, is being projected constantly against the selenium in the top of the box, and this rapid interchange of color is causing the electric current which flows through the selenium to vary constantly in strength as the different colors in the reflection affect the resistance of the selenium. It therefore follows that an electric current is easily obtained, the strength of which depends entirely on the nature of the color which is projected against the selenium. The transmission of colors, or, at least, the transmission of their equivalent in electric currents, is what has been accomplished.

Having accomplished the feat of sending colors, or their equivalents, by telegraph, it now became necessary to separate the various parts or intensities of this varying current, and to resolve them into colors again at the other end of the line. In short, just as the selenium was able to change colors into their equivalents in current, popularly speaking, so must some method be found of changing these currents back into their equivalent colors. It was done in the following manner: The line which transmitted all of these varying currents ended at the receiver in a coil which formed an electro-magnet. When the selenium allowed heavy currents to flow over the wire the electro-magnet became very powerful. When weak currents flowed over the line the electro-magnet became weak. In front of the core of this magnet a large prism was placed. It hung in a horizontal position, and moved on a pivot. Attached to it was a piece of soft iron. This iron was naturally affected by the magnet, and caused the prism to move backward or forward as strong or weak currents flowed from the selenium at the other end of the line.

HOW THE SPECTRUM IS UTILIZED.

It is a well known fact that if a strong beam of light is projected through a prism the latter will separate the various rays of that light and spread them out in the form of a spectrum or band of colored light. All of the reds in the beam will be shown at one end of the spectrum, all of the blues at the other end, with the intermediate colors between. In the receiver of Szczepanik's apparatus a powerful incandescent lamp was placed just back of the prism, which moved on a pivot. Naturally, the prism took up the beam of the electric light and separated it into a spectrum or band of light, with the reds at one end of the band and the blues at the other end. This band of variously colored light shone against a partition in the upper part of the receiving apparatus. There was a narrow slit in this partition, cut so that only one color of the band of light could shine through at a time. By moving the prism backward and forward it was easy to start at one end of the colored beam of light and make first the red lights shine through, and so on along the beam until the blue or violets were reached.



APPARATUS FOR RECEIVING PICTURES BY WIRE.

Now, when the selenium in the first apparatus was affected by red light, and a current corresponding in strength to red was therefore allowed to flow through the wire, the second apparatus was so adjusted that the electro-magnet would turn the prism around until only blue light was allowed to shine through the slit. So that, if the man who stood before the transmitter wore a blue necktie, and the blue of that tie was reflected by the mirrors against the selenium, the latter would immediately cut down the current so that the prism would be turned around until only blue could shine through the slit. If his necktie had been red the prism would be turned until only red could shine through the slit. Thus it will be seen that the mere fact of transmitting colors became a comparatively easy matter. In the lower part of the receiver were two mirrors exactly similar in size, construction and action to the two mirrors in the transmitter, and from these the colors are thrown on a screen.

HOW THE IMAGES ARE FORMED.

But the question will now be asked: Granting that it is possible to transmit plain colors by telegraph, how is it possible to make these colors resolve themselves into proper shapes? How will we know that it is the man's necktie that is red or blue, and not his coat or his vest. To answer this, it must first be stated that the pair of mirrors in the transmitter and the pair of mirrors in the receiver move synchronously. That is, they move or oscillate in perfect time. If the lower mirror in the transmitter assumed for a moment an angle of 45.5 degrees, then the lower mirror in the receiver assumed that exact angle at the same instant. If the upper mirror in the transmitter momentarily assumed an angle of 42.6 degrees, the upper mirror in the receiver also assumed the angle of 42.6 degrees at the same instant. In short, the pairs of mirrors move together in perfect time and in the same direction constantly. Now, if the two mirrors in the transmitter happen to be at certain angles when they send a reflection through the slit on to the selenium, it follows that if the reflection were to be returned to those same mirrors again through that same slit at the same instant, it would naturally spread itself over them in the same form that it had when it first came from them. In short, if the mirrors were in a position at rest so that they could send a triangle of red light through the slit, it would be impossible to send the red light back again through the slit, and have it reflected in any other form than a triangle. The mirrors would have to be moved before the reflected light could assume any other form than a triangle. Hence, as the mirrors in the receiver are precisely the same in size, shape, movement, etc., as the mirrors in the transmitter, and as the size and position of the slits are precisely the same in both cases, it follows that the second pair of mirrors must have the same reflections shot into them as were projected out of the first pair. If a circle of red is reflected out of the upper portion of the first two mirrors through the slit in the first box, a red light coming from the slit in the second box could not strike the mirrors in that box anywhere but on a corresponding upper portion. All the other portions of the mirrors are for the moment out of focus. So, the position and shape of every projected image is determined by the position of the mirrors, and the color of every image is determined by the movements of the prism.

SAME PRINCIPLE AS THE KINETOSCOPE

The value of cutting the reflections of the mirrors into points now becomes apparent. The oscillating mirrors make it possible for only a very small fraction of any image to be seen at a time. For instance, the image of the man standing before the transmitter is shown successively from head to foot, or from foot to head, or in any other direction, but the movement is so rapid that the optic nerve accommodates itself to the condition and really appears to take in his whole form at once. A wheel, for instance, running rapidly down hill, appears to be solid if the spokes are very thick, whereas there is really a great deal of open space between the spokes. The rapidly moving photographs in the kinetoscope, although radically different one from the other, appear to be one moving picture when flashed rapidly past the eye. Likewise, in this new system of seeing by wire, the constantly moving succession of reflecting dots really appears to the eye like one solid and moving picture.

The above is, in brief, a description of the principle and theory of Herr Szczepanik's apparatus for sending colored pictures by wire. If the inventor has succeeded in adjusting his apparatus so as to produce the remarkable combination described above, he has indeed accomplished something which may do as much, if not more, for civilization than the kinetoscope; for it is as far ahead of the kinetoscope as the latter is ahead of the common photograph. One may now be able to sit at home and see a theatrical performance which is taking place in a far distant city. Or, as in the accompanying illustrations, a queen of the ballet can perform in front of a telelectroscope receiver, and have every motion of her graceful form transmitted and exhibited to the delight of audiences hundreds of miles away; and all the colors of her costume would be distinctly reproduced. It has been suggested that, inasmuch as the apparatus will be installed at the Paris exposition of 1900, many persons who will be unable to go to that great show will still be able to see its varied scenes reflected through the mirrors of the telelectroscope. These, at least, are the alluring promises which are made by the projectors of the apparatus.

PERFORMING BEFORE THE TRANSMITTER.

IAN SZCZEPANIK, THE INVENTOR.

RELIGIOUS.

Since 1873 the Methodist Episcopal board of education has aided 8,130 students.

Between 1895 and 1896 the salaries of the clergymen of the Church of England were diminished by 65,000.

It is stated that the Salvation Army has increased in this country in the last year from 30,000 to 60,000, and the number of posts from 594 to 737.

The American Bible society during the last year distributed 767,000 volumes of the holy scriptures in foreign lands, at an expenditure of about $192,000.

Rev. Tatsusabro Mine, a Japanese member of the senior class of Drew Theological seminary (Methodist), expects to enter a conference in Japan within a year.

In the last twenty-five years twenty-one Jewish agricultural colonies have been established in Palestine. They number 6,000 persons and have 100,000 acres of land under cultivation.

Bishop Santander is the resident Catholic prelate of Havana and the full title of his see is San Christobel de la Habana. He was consecrated St. Patrick's day, 1887, and has jurisdiction over 1,300,000 souls, worshiping in 147 parochial and 237 other churches and chapels and requiring the services of 228 priests.

The Independent says the Protestant denominations since 1880 have registered a net increase in communicants of 73 per cent and the Roman Catholic church has gained 54 per cent.

There are seventy-one synagogues in the limits of Greater New York, of which there are fifty-four within the former city limits, sixteen in the borough of Brooklyn and one on Staten island, or, as it is now known the borough of Richmond.

The bishop of the Klondike has territorially one of the biggest sees in the world, extending over 200,000 square miles. But it is not the biggest see but the biggest find that most interests people in that region just now.

The bishop of Bristol, Eng., has so keen a sympathy with dumb animals that he protested publicly at a meeting the other day against the cruelty of muzzling dogs as a precaution against hydrophobia. He went about, he said, with his legs more accessible to the bite of a dog than most people, but he did so with confidence, and no ill-effects had resulted.

A prominent Roman Catholic of Washington is thus quoted in the Philadelphia Press: "Archbishop Corrigan has been sending large sums of money and much food to Cuba ever since last September. Archbishop Hennessy of Dubuque, the wealthiest of the American hierarchy, has shipped a large cargo of flour to the Cubans. These alms have been distributed under the supervision of the bishop of Havana, and largely through the agency of Madames of the Red Heart, whose pathetic appeal for aid for their suffering people was published in the American press and has drawn forth a liberal response from the Catholic clergy of the United States months before the government made its public solicitation. It was these efforts on the part of the bishop of Havana to assuage the agony of Weyler's cruelty that was the principal cause of quarrel between them. The bishop has appealed to Rome against Weyler at least six times. In each instance the pope has sustained the prelate." Over $500 was forwarded to the bishop of Havana last month from the diocese of Omaha.

GOSSIP ABOUT NOTED PEOPLE.

Peculiarly ill matched from a physical standpoint are Congressmen Cyrus Adams Sulloway and Frank Gay Clarke of New Hampshire. "Cy" Sulloway is six feet six inches tall, immense of body and massive of limb, with a heavy and powerful voice and an abrupt, outspoken manner. Clarke is so short as to easily walk under his colleague's outstretched arm, has a polished manner, graceful conversational ability and is always neatly dressed. Sulloway has a vast stride and his boots resound as he treads the sidewalk.

General Rosecrans, during one of the most critical moments of the battle of Chickamauga, is said to have dashed into the hottest of the fire to rally the men of Davis' command, who had begun to waver before the terrible assaults of superior numbers of the enemy. A young staff officer who accompanied him begged him to retire to a safer place and not expose himself to almost certain death. To the expostulation of the young officer the general replied: "Never mind me, boy, but make the sign of the cross and go in."

Here is a story at his own expense that Consul General Lee is fond of telling: "We had surrendered at Appomattox and I was riding slowly across the desolate country toward my home. My heart was heavy, my thoughts were sad. Rounding a curve in the road I saw an old man plowing close to the fence. As I approached him he eagerly inquired of the news at the front. 'It is bad, very bad,' I replied. 'General Lee has surrendered.' 'What is that you're sayin?' almost screamed the old fellow. 'General Lee has surrendered and all is over.' For fully a minute he regarded me and then said with great contempt: 'That's all you know about it. That little upstart of a no 'count Fitz Lee mout have surrendered, but Uncle Robert? No, siree, never! Gee up, Bess.' "

Captain Silas Casey, commandant of the League island navy yard, who has become ranking captain in the navy, was graduated from the United States Naval academy in 1860 and was a master in the navy when the war broke out. From 1870 to 1873 he was on the Colorado, then attached to the Asiatic squadron. He was in command of the battalion of sailors from the fleet in the Corean expedition and the assault on Fort McKee, Seoul river, in June, 1872. Since that he has held many important places. Before taking command of the League leland navy yard he was captain on board Admiral Sicard's flagship, the New York. All told, Captain Casey's actual sea service covers a period of nineteen years and nine months, three years and one month of which were under his present commission.

Speaking of the late Charles B. Wright, formerly president of the Northern Pacific railroad, the Philadelphia Ledger says: "He was the founder, in fact, of Tacoma, the western terminus of the road, although that honor is shared, in a measure, with other members of the committee appointed to select a site. The committee was sent to the Pacific coast in 1873, and spent a week or more cruising in Puget Sound. Tacoma then was nothing but a sawmill and a few workmen's houses. He saw the natural advantages of the harbor and location and the committee reported in favor of that terminus. Had it not been for Mr. Wright's energetic action as president of the railroad and land companies at a critical period the town of Tacoma, for which such a bright future had been planned, might still be little more than a sawmill and the same settlement of workmen's houses."

Hingham, Mass., is proud of Secretary Long, according to the Boston Transcript. "Mr. Long did not, indeed, spring from the soil of Hingham, but he has lived there so long and so completely imbibed the spirit of the place that he partakes of the characteristics, beyond a doubt, of the natives. The air of Hingham is much like that of England, which forbids desiccation and caducity. A great poet has spoken of a maiden who was 'as sweet as English air could make her.' If we were to speak of a woman who was as sweet as Hingham air could make her we should pay her beauty a high compliment indeed. And this is the sort of air which Mr. Long has had the benefit of. His present glory, earned by sterling qualities of mind, sustained by goodness of heart, is the glory of Hingham."

Henry Jacobs of Lincoln, Kan., has erected a curious monument over the grave of his son, who was of a roving disposition. He had a stone cut in the shape of an old-fashioned traveling satchel. On the plate in the center of each side is the name "J. S. Jacobs." Just above the name is this inscription: "Here is Where He Stopped Last." Underneath the name is the date of death and his age. The stone is white marble, and the base is a big bowlder which the father hauled from his farm and rolled on the grave. When questioned as to why he chose such a unique design the old man said: "Wall, Jim, he were a sort of rovin' feller, and I allowed that this design would 'bout suit him. He never stopped very long before in any one place. But the last time I see him he were at the graveyard, and I jes' concluded that he might stay thar a long while. So I had a sign printed on ther stone sayin' whar he was last seen and whar he ought to be now."

"The viceroy of Hankow," says a correspondent of the Providence Journal, "is a nice man, but he didn't ask us to lunch. He is a great scholar. He is a student of John Stuart Mill and Metropolitan railway timetables. He is what you call an advanced man. He wrote such a splendid article on the advantages of steam engines two years ago that the emperor wrote: 'Dear sir. I entirely agree with you; please build a railway between Pekin and Hankow.' And already a few hundred feet of embankment have been built—there is a temporary cessation of work, owing to a lack of funds—but it is confidently expected that in about four centuries the line will be completed. Meanwhile he is running an ironworks and a cotton mill on strictly European lines, but with a difference—he has the most expensive English machinery, and he has English workmen, but he won't allow an Englishman to have any voice in the management. Knowing Confucius off by heart and half Mencius, he himself is, of course, the best person to manage a cotton mill and an ironworks. He can't understand why both ventures are dead losses."

NOVEL OPERATION.

One Man's Leg Used on Another Man's Arm.

Unique in many ways was an operation performed at the City hospital recently, relates the Cincinnati Enquirer, and it is questionable whether in all medical history there is any record of the peculiar makeshift as employed on this occasion. The operation was in reality simply a continuation of the one begun the day before upon John Heuschan.

Heuschan, it will be remembered, is the employe of the Buckeye Arc Light company who sustained severe burns about the back, chest and right arm, the latter member being reduced to a piece of raw flesh from the shoulder to the wrist. On Monday the greater part of the arm was skin-grafted from the shoulder down, large pieces of the epidermis of the man's thigh being shaved off and transplanted to the burned part. There still remained a considerable portion to be covered yesterday, and the surgeon in charge of the case was at a loss for more skin. It was in this dilemma that the surgeon's ingenuity and versatility asserted itself. Only an hour before he had amputated the left leg of John Schmidt, whose home is at No. 32 West McMillan street, on account of an old abscess above the knee, which made the amputation necessary. The suggestion to utilize th's splendid raw material, which in a few hours would go to waste, and for which Schmidt had no further use, came like an inspiration and the suggestion was immediately acted upon. Soon large strips of Schmidt's amputated leg occupied the open spaces on Heuschan's arm, covering it completely with a substantial, healthy cuticle, which will become as integral a part of Heuschan's body as his own skin when the process of healing begins. Schmidt does not know of the transfer of part of his body to Heuschan's, and Heuschan is likewise ignorant of how much he is indebted to Schmidt in his dire emergency.

American and European expositions have awarded premiums to Cook's Imperial Champagne, for its excellent qualities.