

**Marconi and De Forest Wireless Litigation.**

The United States Circuit Court for the Southern District of New York recently issued an injunction against the De Forest Wireless Telegraph Company as the result of a bill in equity filed by the Marconi Wireless Telegraph Company of America, alleging infringement of Marconi's fundamental patent issued July 13, 1897, and numbered 586,193.

In a very ably written opinion Judge Townsend reviews the state of the art previously to Marconi's first experiments, discusses the nature of Hertzian waves, and outlines the essentials of a commercial wireless telegraph installation. The injunction restrained the infringement of claims 3 and 5 of the Marconi patent. Claim 3, the broader of the two, reads as follows:

"3. The combination, in an apparatus for communicating electrical signals, of a spark-producer at the transmitting station, an earth connection to one end of the spark-producer, an insulated conductor connected to the other end, an imperfect electrical contact at the receiving station, an earth connection to one end of the contact, an insulated conductor connected to the other end, and a circuit through the contact, substantially as and for the purpose described."

The specific infringement complained of consisted in the installation and use by the De Forest Wireless Telegraph Company of its stations between New York city and Staten Island. In this particular installation the transmitting and receiving stations were equipped with high vertical wires insulated at the top. At the transmitting station were a dynamo, directly producing an alternating current, primary and secondary coils, Morse telegraph key, a spark-gap, and a condenser, most valuable adjunct to the practical operation of wireless telegraphy, but not directly involved in the suit. The high-frequency oscillations created or produced, as in the Marconi system, were radiated from the vertical wires of the transmitter and, traveling across to the receiver, impinged upon its wires and traveled down to a so-called detector or variable resistance conductor, closely corresponding in function and result with the coherer of Marconi's patent, and alleged to be its equivalent.

One of the main points at issue in the suit was the use of insulated conductors, described and illustrated in Marconi's patent as metallic plates suspended by poles on wires and insulated from earth. The conductors of the 1898 system of Marconi are aerial wires insulated at the top, but connected with the earth at the bottom.

Both complainant and defendant, at the time the bill was filed, used a construction where the conductors were insulated at the top, but only interrupted or obstructed as to the earth connection at the bottom. The complainant contended that defendant admitted that it is immaterial whether the aerial is insulated from the ground at the lower end. Dr. De Forest said that he preferred to employ earth connections because they permitted transmission to greater distances. Both sides agreed that the function of the earth was not satisfactorily understood; both agreed that such an earth connection is an advantage possibly due to a guiding and strengthening force to conduct the waves to the surface of the earth so that they may glide farther through the ether.

In this state of uncertainty as to the whole subject the court thought that Marconi should not be deprived of the benefit of his real invention upon any narrow limitation as to the earth connection or interruption at the lower end of the conductor, when it did not appear that even in the case of the spark-gap or tube filing obstruction the earth did not discharge the same functions as it is now supposed to discharge, and when presumably the question is merely one of degree, the strength being theoretically greater in degree where the earth connection is merely obstructed by a transformer.

The rather sensational press reports which gave to Judge Townsend's decision an exaggerated effect must be taken with the proverbial pinch of salt. The injunction is not directed against the present De Forest system or against the present American De Forest Wireless Telegraph Company. It is issued against a defunct De Forest company and against the use of an apparatus which, we are informed, was an experimental and discarded form of apparatus used but a short time in 1902. It is claimed that the apparatus enjoined has never been used by the present American De Forest Wireless Telegraph Company. Indeed, De Forest and Marconi are now engaged in patent infringement litigation which may continue for several years before the respective rights of the parties are decided by the courts.

Almost simultaneously with the granting of the injunction, there appeared in the Patent Office Gazette a disclaimer of the invention covered in claim 1 of the patent in suit. The patent had been reissued and claim 1 so broadened that its terms cover every form of imperfect contact in every possible kind of system for producing signals by means of Hertz oscillations. In view of the limitations imposed upon the Marconi coherer by the disclosures of Branly, Popoff, and

Lodge, such a generic claim, much broader than those of the original patent for which it seems to have been substituted, should not have been permitted when the effect would be to enlarge the scope of the original invention.

In the original patent Marconi limited most of his claims to a combination in a receiver for electrical oscillations of his coherer, consisting of a tube and powder, and means for shaking the powder. But inasmuch as this had been disclosed by prior publications, he applied for the reissue, and by claim 1 attempted to cover not merely the coherer of his former claims or any such coherer in a receiver, or a coherer with means for shaking the powder therein, but every form of imperfect contact device, previously disclosed by others or which might be thereafter discovered, whenever combined with any electrical signal apparatus using Hertz oscillations. This claim, if allowed, would apparently cover the prior devices of Lodge and Popoff, the latter of which is claimed to have necessitated the disclaimer and reissue. Hence the injunction did not apply to claim 1, and hence the disclaimer.

**Decomposition of Dust upon Heated Bodies.**

In heated rooms we often perceive an unpleasant tickling odor, which irritates the mucous membrane of the larynx and causes coughing. It comes from burnt and decomposed dust, from which ammonia and other hurtful substances arise. This decomposition, which occurs only when the dust is damp, is most frequently found with the usual iron stoves whose sides easily become red-hot, in consequence of which the particles of dust lodging on the stove burn and vitiate the air. But the hot-air flues of furnaces also easily become overheated, in consequence of which dust lodging burns and the products of the burning mingle with the air. The Freie Deutsche Presse says that Prof. Esmarch, of Hanover, "found in his investigations that, on small heated bodies not above 70 deg. C. in temperature, the dust is always decomposed. On ground floors, indeed (where the air rushing in directly from the street is mingled with the dust from the horses' evacuations), the bad odor already begins to be perceptible when the surfaces are heated to 65 deg. Notable is the observation made by Nussbaum, that dust which proceeds from air artificially saturated with steam evolves vapors more evil-smelling and irritating than the dust from ordinary air. In order to prevent the vitiation of the air in a room, the heated surfaces must not be heated over 65 deg. to 70 deg., and every further addition of moisture to the air is to be avoided. Of course, the heated bodies themselves are to be kept scrupulously clean and are to be frequently washed off. But this cleansing does not fully protect from the decomposition of dust, because the air sweeping past the heated bodies always brings dust upon the heated surfaces again. In furnace heating, the air must be carefully kept free of dust, i. e., be filtered."

**Gentian as a Cure for Malaria.**

The root of gentian, often used as a tonic, is considered in many malarial countries a remedy against intermittent fever. Especially is this the case in Corsica in that section of the island near the town of Aleria, which is infested with malaria. The inhabitants recently protested violently against the introduction of quinine on the part of the medical authorities, declaring that they would not abandon the remedy which had been used among the islanders for centuries, namely, the gentian root either powdered or simply masticated.

Tancret declares that he has extracted from this root a hitherto unknown substance, which belongs to the chemical classification of glucoses. This he calls genziomerina, and experiments in the laboratory prove that it possesses the same deleterious action upon the malaria bacillus as does quinine. Here, then, we have another example of how popular instinct often anticipates with a certain sureness the discoveries of science.

**The Current Supplement.**

An excellent article on the Isthmus of Tehuantepec and its interoceanic railway opens the current SUPPLEMENT, No. 1579. John F. Wallace, ex-Chief Engineer of the Panama Canal, gives his views on the way the canal ought to be constructed, and makes a strong plea for the sea-level canal. J. E. Petavel's report on the pressure of high explosives is concluded. "Some Notes on Fuel Briquetting in America" is the title of a very good article by Clarence M. Barber. F. F. Robin tells how filled capsules are made. Prof. Shaw's electric micrometer for measuring the seventy-millionth part of an inch is fully described by the English correspondent of the SCIENTIFIC AMERICAN. Something of the wonderful sensitiveness and accuracy of this instrument may be gathered from the fact that it must be used some twelve feet below the street level at night time, when all traffic and factory work have been suspended. A very good history of the marine turbine is published.

**Correspondence.****The Soaring of Birds.**

To the Editor of the SCIENTIFIC AMERICAN:

I have evolved a theory concerning bird flight which seems to be novel, and as this question is apparently still open for discussion, I have decided to submit the same to your readers.

A close observer of bird life knows that there must be some motive power other than that provided by the wings. While the air-current theory for soaring birds, and the wing theory for those that work the wings up and down, partially answer, how about those that almost seem to neglect spreading the wings when starting from a perch and then fly in graceful curves, downward and upward alternately, closing and opening the wings with each curve? In extending the wings the contraction of the muscles of the breast counterpulls against the shoulder joints, which are so formed as to create a vacuum or a partial vacuum. This, perhaps, may be regarded as the center of gravity; and thus, the air pressure being the same in all directions, the speed is acquired by the weight of the body back of the shoulders, less the weight forward of that point.

That the muscles of a flying bird's breast are vigorously exercised is shown by the dark color, while the breast of a domestic fowl is white.

Greenfield, Iowa.

Mrs. R. H. LOVELY.

**The Murren Railway.**

To the Editor of the SCIENTIFIC AMERICAN:

The issue of February 24, 1906, No. 8, of the SCIENTIFIC AMERICAN contains an article about the Murren Railway.

Please allow me to give you some other information concerning that line.

The Murren Railway, on its section Lauterbrunnen-Grütsch Alp, was opened to traffic on August 14, 1891. It was operated on the water-counterweight system, as described in the article mentioned.

Some years ago, the number of travelers in Switzerland increasing very rapidly, it was found necessary to enlarge the capacity of the line, and in 1902 it was electrified. The station Grütsch Alp was equipped with electro-motors.

It turns around two large pulleys, one at each station. The cars are attached to the cable, and by this method are very accurately balanced, so that the emptying of the tank during the descent is not necessary. The line is 1,695 meters long, and the journey takes fifteen minutes.

The large front-page engraving in the same issue, that you give as "A Turnout on the Murren Railway," is not on that line, but on the Salève electric railway, near Geneva, Switzerland, but on French territory. It is built on the third-rail system, which is clearly shown in the photograph.

EDG. ROSSIAUD.

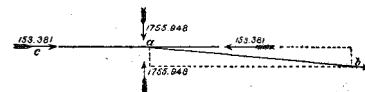
Zurich, Switzerland, March 14, 1906.

**The Theory of the Hydroplane.**

To the Editor of the SCIENTIFIC AMERICAN:

The paper by Ernest Archdeacon, "Sixty Miles an Hour on the Water," in your issue of March 3, is both interesting and important.

His statement, "the theory of the hydroplane, which is, moreover, identical with that of the aeroplane," is entirely correct. But the succeeding statement, that "the draft of water becomes zero, and the displacement also," contains error. The displacement can never become zero so long as the hydroplane has weight. The diagram of both the hydroplane and aeroplane is here-with given, with Count de Lambert's weight of 1,763 pounds. The resistance to motion in each case is fluid pressure and skin friction, the direction of both being fixed by the law of fluids, the first being normal to the plane, and the second along the plane, and for those reasons at right angles to each other.



Numerical values are given for an inclination of 5 degrees, and the sine and cosine of the angle are used in the usual way. Gravity being oblique to both reactions, is resolved into factors, 1,755.948 pounds, making normal pressure, and 153.381 pounds along the surface. Then the motive power is applied on *c*, canceling the small factor, and enough more to overcome skin friction, which is practically negligible. The diagram represents the activity at the instant of uniform motion, when inertia of mass no longer exists. *ab* is a resultant of two motions, and no energy is discharged on that line. The motive power of the boat has nothing to do with normal motion or displacement, since it is perpendicular to it, 90 degrees away, and cannot possibly act upon it.

I can see no reason why a hydroplane could not be urged to a velocity on water equal to that of an automobile on land. Resistance of air need be no greater in one case than in the other.

I. LANCASTER.

Fairhope, Ala., March 7, 1906.