

W. SCHLOEMILCH & P. F. PICHON.
 SYSTEM OF RADIOTELEPHONY.
 APPLICATION FILED NOV. 29, 1907.

1,052,849.

Patented Feb. 11, 1913.

Fig. 1

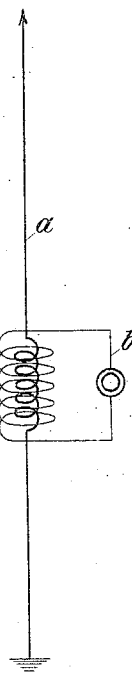
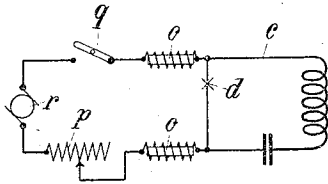


Fig. 2

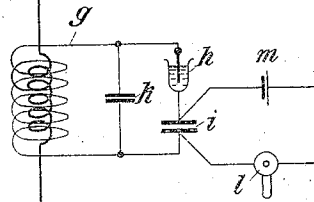


Fig. 3

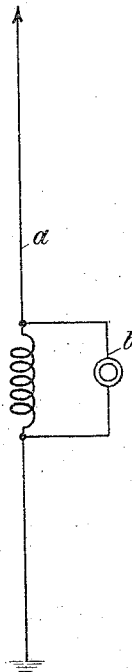
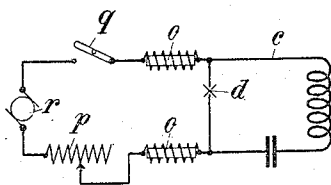
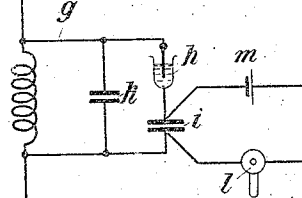


Fig. 4



Witnesses
 Octavio Knight
 H. Alfred Jauke

Inventors:
 Wilhelm Schloemilch
 and
 Paul Ferdinand Pichon
 by *Ernest Pross* Attorneys

UNITED STATES PATENT OFFICE.

WILHELM SCHLOEMILCH, OF BERLIN, AND PAUL FERNAND PICHON, OF SÜDENDE,
NEAR BERLIN, GERMANY, ASSIGNORS TO GESELLSCHAFT FÜR DRAHTLOSE TELE-
GRAPHIE M. B. H., OF BERLIN, GERMANY, A CORPORATION OF GERMANY.

SYSTEM OF RADIOTELEPHONY.

1,052,849.

Specification of Letters Patent.

Patented Feb. 11, 1913.

Application filed November 29, 1907. Serial No. 404,443.

To all whom it may concern:

Be it known that we, WILHELM SCHLOEMILCH, engineer, a subject of the King of Prussia, residing at Berlin, Germany, and
5 PAUL FERNAND PICHON, engineer, a citizen of the Republic of France, residing at Südende, near Berlin, Germany, have invented a new System of Radiotelephony, of which the following is a full, clear, and
10 exact description, reference being had to the accompanying drawing, forming a part of this specification.

The object of the present invention is a new system of radio telephony in which the
15 transmitter is excited by means of continuous oscillations of constant amplitude in accordance with the known system of Thompson-Duddell, moreover the aerial transmitting conductor is exposed directly
20 to the alterations of the resistance of the microphone instead of through the medium of the exciting circuit.

Another essential feature of this system consists in the dimensioning of the coupling
25 between the exciting circuit and the transmitter circuit at the transmitter station and between the receiving circuit and the detector circuit at the receiving station.

A special advantage of the new system resides in the fact that resonance phenomena on the transmitter and receiver station
30 which are extremely detrimental to the distinct transmission of the words, are obviated.

The well-known method of increasing the
35 amplitude of oscillations in receivers by means of resonance inevitably results in an essential alteration of the shape of the oscillation. In wireless telephony it is however essential for a clear reproduction
40 to have the shape of the curve in the telephone identical to the shape of the energy curve of the system containing the microphone. For this purpose the transmitter microphone is not connected to the exciter
45 circuit but to the transmitter antenna. In the latter high frequency currents are conveniently induced by means of a loose coupled system. From empirical results it has been found that the best results are obtained
50 if the degree of coupling does not exceed about 3%. The loose coupling insures that the shape of the current curve is unaffected by reaction on the energy circuit. At the same time the purpose of making the ampli-

tude of the oscillations in the aerial conductor very great is attained, inasmuch as
55 resistance variations result in great variations of the radiating properties of the aerial conductor in case of loose coupling. Contrary to the usual scheme of connections
60 for transmission with undamped oscillations or only slightly damped oscillations an integrating detector is connected to the receiving aerial conductor either directly or
65 by means of a resonance circuit in such a manner that the aerial conductor is made practically aperiodic. In consequence the energy that has been received is transmitted
70 to the detector instantly and produces in the telephone currents or variations of a direct current which are exactly in accordance with the amplitude of the high frequency currents in the transmitter.

The accompanying drawings show diagrammatically an application of the present
75 invention in two modifications.

Figure 1 is a diagram of a transmitter station, according to the invention. Fig. 2
is a diagram of the cooperating receiving station. Fig. 3 is a diagram of a modifica-
80 tion shown in Fig. 1, and Fig. 4 is a diagram of the cooperating receiving station also modified accordingly.

In Fig. 1 *a* indicates the transmitter circuit or aerial conductor which is connected
85 to the microphone circuit *b* inductively by means of a rigid coupling. The transmitter circuit is excited by means of the closed exciter circuit *c*, which is energized by a circuit containing dynamo *r*, regulatable resistance *p*, choking coils *o* and switch *g*.
90 The circuit *c* is tuned to the transmitter circuit and contains an arc *d* for the production of undamped waves, the coupling between the exciting circuit and the transmitter circuit being less than 3%.
95

In Fig. 2 *f* indicates the receiver circuit which is connected inductively to the detector circuit *g*. The detector circuit forms a resonance circuit which contains high self
100 induction and a condenser *k* of low capacity; an integrating detector *h* for instance an electrolytic cell as shown, is connected in parallel to the said condenser. In a case of this kind the resonance circuit must
105 naturally be coupled as rigid as possible with the aerial conductor.

In series with the detector *h* is disposed

a condenser *i*, to which an indicator *l* for instance a telephone and a source *m* of direct current energy is connected. The condenser *i* serves as blocking condenser with regard to the direct current produced by the current source *m*.

Instead of the inductive coupling between the microphone circuit and the transmitter circuit and between the detector circuit and the receiver circuit in both cases a conductive connection may be used, as shown in Figs. 3 and 4. As will be seen in Fig. 3, the microphone circuit *b* is conductively connected to the transmitter circuit, and from Fig. 4 it will be seen that the detector circuit is conductively connected to the receiver circuit.

Having explained our invention, what we do claim and desire to secure by Letters Patent is:

1. In a system for radio-telephony a transmitter circuit, an exciting circuit coupled with the transmitter circuit, means for producing continuous oscillations of constant amplitudes in the exciting circuit, a microphone electrically connected with the transmitter circuit for directly influencing the same, a receiver circuit, an integrating

detector, an indicator connected with the receiver circuit, the coupling between the exciting circuit and the transmitter circuit being less than 3%, substantially as described.

2. In a system for radio-telephony a transmitter circuit, an exciting circuit, coupled with the transmitter circuit, means for producing continuous oscillations of constant amplitudes in the exciting circuit, a microphone electrically connected with the transmitter circuit for directly influencing the same, a receiver circuit, an integrating detector, an indicator connected with the receiver circuit, the coupling between the exciting circuit and the transmitter circuit being less than 3% and the coupling between the receiver circuit and the integrating detector being as rigid as possible, substantially as described.

In witness whereof we hereunto subscribe our names, at Berlin this 12th day of November A. D. 1907.

WILHELM SCHLOEMILCH.
PAUL FERNAND PICHON.

Witnesses:

WOLDEMAR HAUPT,
HENRY HASPER.