

C O P Y

WESTINGHOUSE ELECTRIC & MFG. COMPANY

E. PITTSBURGH, PA.

October 13, 1928

Dear Mr. Hutchinson:

It is my understanding that you are in a position to receive nominations for the Lamme Medal Award, and it seems to me most fitting that one of Mr. Lamme's associates as well as a prominent engineer, Dr. Frank Conrad, should be considered as a worthy candidate for this honor. With this in view, I am proposing his name for such consideration.

I am advised that the proposal of a candidate for this award must be made by a member of the Institute, with the names of at least three prominent American engineers for reference. For these references I suggest the following:

Mr. David Sarnoff, Vice-President & General Manager,  
Radio Corporation of America, New York  
Mr. W. D. Terrell, Chief Radio Division,  
Department of Commerce, Washington, D. C.  
Dr. J. H. Dellinger, Bureau of Standards,  
Washington, D. C.  
Mr. S. M. Kintner, Manager, Research Department  
Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.  
Prof. Chas. F. Scott,  
Yale University, New Haven, Conn.  
Mr. W. S. Rugg, Vice-President,  
Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.  
Mr. C. E. Wilson, President and General Manager  
Delco-Remy Co., Anderson, Indiana

I am enclosing a very brief and general synopsis of Dr. Conrad's engineering record.

Very truly yours,

(Signed) H. P. DAVIS

Vice-President



## FRANK CONRAD

Frank Conrad was born in Pittsburgh and received his fundamental education in the public schools of this city. He had from birth a great curiosity regarding human knowledge in many fields and was a wide reader with a most retentive memory. His temperament and the fund of general information which he gathered during his grade school years led him to pioneer his own education beyond that point with such success that in 1928 the University of Pittsburgh felt honored in granting him the well-earned degree of Doctor of Science.

He began his work with the Westinghouse Elec. & Mfg. Co. in 1890 and progressed steadily upward in their organization until he reached the duties of Assistant Chief Engineer which he has discharged since 1921.

His versatility of interest and his sureness of accomplishment made him useful in many fields and it is characteristic of him that he seems to have laid the ground work required for any problem before it is put up to him. His energy and engrossing interest in his immediate work seem to spring from an inexhaustible source of curiosity to fathom more and more mysteries of science and engineering.

During the early years of his work he did extensive work on a.c. and d.c. electrical measuring instruments of the indicating, integrating, and recording types. The majority of his patents, of which there are about 150, are in this field. He is also credited with originating the present science of selective protection of a.c. systems by means of relays.

A little later he made many inventions in developing arc lamps and in the general field of industrial motor control.

He was associated with Mr. H. P. Davis and Mr. B. G. Lamme in the solution of many difficult problems arising in connection with the electrification of the New York, New Haven, and Hartford Railroad, and contributed largely to the success of this installation.

At a later period he devoted much of his time to the application of electric starting, lighting and ignition to automobiles. On an early model of Pierce Arrow car he originated the single wire system, which was later adopted as standard by the industry and is now universally used. He was also active in the development of battery ignition with an induction coil as distinguished from the high tension magneto previously used.

Again, he was a pioneer in the development of the metal case power rectifier and contributed some details now common in this art.

His latest work and perhaps his best known has been in connection with the radio art. During the war activities he was closely associated with the work of the United States Signal Corps and from that beginning he went ahead in characteristic manner doing research and contributing new ideas to the fast developing



giant of broadcasting and its allied interests. From his amateur radio station, the pioneer broadcasting station of the world, KDKA, was evolved. In this field Doctor Conrad can lay claim to basic ideas on the use of short waves for transmission. For his work in this connection, in January 1926, he was awarded the Morris Liebman Memorial Prize of \$500 by the American Institute of Radio Engineers. This award was for "a most important contribution to the progress of radio communication". He can also lay claim to the simultaneous and synchronous transmitting by a number of stations on the same wave length and he is credited with valuable work in connection with modulated frequency. His many patents in connection with radio systems and apparatus are proof that his genius and energy have produced practical results.

Doctor Conrad is a member of the American Institute of Electrical Engineers, Institute of Radio Engineers, American Association for the Advancement of Science and an Army Ordinance Assistant.

---



C. O P Y

DEPARTMENT OF COMMERCE

Washington, D.C.

October 19, 1928

Dear Mr. Henline:

I have your letter of the 16th instant informing me that my name has been furnished your committee as one who is somewhat familiar with the achievements of Dr. Frank Conrad.

I have known Dr. Conrad by reputation for a long time and have known him personally for about ten years. Of course, I am not familiar with the general activity of Dr. Conrad in the Westinghouse organization, but through the information I have received in talking to those who visit the Westinghouse Works, those who are somewhat familiar with his work, together with my own personal experience when visiting the Westinghouse Plant, I am of the opinion that Dr. Conrad in the Westinghouse organization occupies a position somewhat similar to that formerly occupied by Steinmetz with the General Electric. He seems to be familiar with all of the major problems and apparently is the guiding spirit in much of the new development work. This is particularly true in our relation to the electrical industry. I find that Dr. Conrad is directly concerned with the radio development work.

I think it can truthfully be said that Dr. Conrad's experiments in connection with radio telephony resulted in the inauguration of our present day broadcasting. He was one of the first, if not the first, to recognize this new field of service and its development is due largely to his efforts in the early days.

As a single illustration we found in our service that we were not prepared to check the frequency of stations with the degree of accuracy which efficient service would demand. Our problem was placed before Dr. Conrad and now his Company under his guidance is developing radio frequency measuring equipment which I believe will be found to be in advance of anything used in the world today.

In my opinion and among my acquaintances I do not believe there is anyone in the electrical industry associated with radio of higher standing personally or professionally than Dr. Conrad and I am glad to have the opportunity to express my views in his behalf which I trust will be of some use to your committee.

Respectfully yours,

(Signed) W. D. TERRELL

Chief, Radio Division



C O P Y

WESTINGHOUSE ELECTRIC & MFG. CO.  
E. Pittsburgh, Pa.

October 20, 1928.

Dear Mr. Henline:

In reply to your letter of October 16, it gives me great pleasure to testify the fitness of Dr. Frank Conrad for the Lamme Medal for which he has been proposed.

I have known Dr. Conrad since 1903 and have been in fairly intimate contact with his engineering achievements during that period. His earlier work was confined principally to what is generally determined detail apparatus, that is, meters, switches, circuit breakers and accessories of that general nature. In this work he displayed unusual ingenuity and judgment and was the creator of a number of appliances that found very useful applications in the art.

During the war period Dr. Conrad was called upon for assistance by the Departments in the development of a number of ingenious devices required for war service. These included not only electrical equipment but some explosives such as hand grenades and bombs, etc. He conducted a number of tests at East Pittsburgh which proved successful and which resulted in the perfection of hand grenades that were adopted for Government use. During this same interval Dr. Conrad was the leading spirit in the Westinghouse organization in the perfection of radio equipment, both sending and receiving that was requested for the Government for military and naval service.

Subsequent to the war he continued his investigations in radio and it was as a direct outcome of this continuation that we have what is known as "radio broadcasting service".

Dr. Conrad is an officer of this Company, directed and operated in his own garage the first broadcasting station that was ever put into service and from this humble beginning shortly after the war sprung up this tremendous industry now generally termed "radio".

Dr. Conrad did more than simply imitate this activity. He designed new transmitting stations, new appliances to improve the quality of transmission, and to his investigations we were very largely indebted to the extensive work that has been done in short wave radio transmission. Prior to his investigations of the short waves, it was generally accepted that they were useless excepting for very short distance but now the reverse is known to be the fact and this was first established by him.

I can unhesitatingly say that he is undoubtedly qualified for such a medal and unquestionably meets all of the requirements laid down by those in charge of the awarding of same, and I can reiterate my pleasure in so testifying in the above.

Very truly yours,  
(Signed) S.M.Kintner, Mgr. Research Dept.



C O P Y

RADIO CORPORATION OF AMERICA

233 Broadway, N.Y.

October 23, 1928

David Sarnoff  
Vice-president and General Manager

Dear Mr. Henline:

In response to your letter of October 16, it is noted by reference to the by-laws of the Lamme Medal Committee that the medal is to be awarded for "meritorious achievement in the development of electrical apparatus or machinery". Taking this as a criterion, there can be no question that Mr. Conrad's accomplishments in the various divisions of electrical engineering entitle him to such recognition as was evidently the purpose of the Lamme award.

My contact with Mr. Conrad's work has been primarily in the field of radio communication. In this field alone his accomplishments are of outstanding character and thoroughly recognized by the members of his profession.

One of his most important contributions to the field of radio engineering was the development of broadcasting transmitters and receivers, and the establishment of the first scheduled broadcasting service of high quality. The later rapid development of broadcasting may be regarded as in considerable measure the consequence of Mr. Conrad's pioneer work.

His more recent researches in the field of short-wave transmission and reception have been of such quality as to win him special recognition by the Institute of Radio Engineers, inasmuch as he received the Liebman Memorial Prize for his contribution to the development of this field.

He is at present engaged in important research work in the field of television and other radio subjects and continues to contribute valuable methods and devices to the various divisions of radio engineering and electrical engineering in general with which he is connected.

Accordingly, I take great pleasure in placing myself on record as thoroughly endorsing his nomination for the Lamme Medal.

Very truly yours,

(Signed) DAVID SARNOFF



C O P Y

WESTINGHOUSE ELECTRIC & MFG. COMPANY

E. Pittsburgh, Pa.

October 24, 1928.

Dr. C. F. Scott,  
Yale University,  
New Haven, Conn.

Dear Dr. Scott:

I understand that Dr. Frank Conrad has been proposed for the award of the Lamme Medal and that an outline of his work has been forwarded to Secretary Hutchinson. I am very pleased to endorse Dr. Conrad for this award as I think it is particularly fitting that he should be the first recipient of this medal in view of his long personal contact and official relations with Mr. Lamme.

I would suggest that the following statement for insertion in this certificate be considered:

"For his pioneering and practical  
developments in electric metering  
and short wave radio transmission."

Dr. Conrad has, of course, done very important work in other lines, but it would seem to me that his most outstanding achievements are covered by the above statement. The above suggestion is made as I understand that some brief and comprehensive statement is necessary to be included in the certificate which is to be awarded to the recipient of this medal.

Very truly yours,

(Signed) C. E. SKINNER

Assistant Director of Engineering.



C O P Y

DELCO-REMY CORPORATION

Anderson, Indiana

October 30, 1928.

Dear Mr. Henline:

I am certainly pleased of having the opportunity of recommending that the Lamme Medal be awarded to Frank Conrad.

I have known Mr. Conrad for some eighteen years, and was closely associated with him in the early development of electrical equipment for motor cars. I have always considered Mr. Conrad as one of the keenest engineers and most ingenious inventor of special electrical equipment of my acquaintance.

I am also familiar with some of Mr. Conrad's early radio work, and during the war period, was associated with him in the design of radio generators and dynamotors for some of the special equipment required by the Signal Corps. From time to time, I have heard of some of Mr. Conrad's more recent achievements, and I am certain that he should be classed as an outstanding engineer and inventor such as this Lamme Medal is intended to reward.

Very truly yours,

(Signed) C. E. WILSON



C O P Y

WESTINGHOUSE ELECTRIC & MFG. COMPANY

E. Pittsburgh, Pa.

November 3, 1928.

Dear Mr. Henline:

Referring to your letter of October 16th with reference to the name of Dr. Frank Conrad as candidate for the Lamme Medal, I note the conditions; namely, meritorious achievement in the development of electrical apparatus or machinery.

I have known Dr. Conrad many years and have had rather intimate knowledge of his accomplishments. It would be difficult for me to mention anyone at the present time who, in my opinion, had affected the development of electrical apparatus or machinery more than has Dr. Conrad. His work has been of a broad character and has affected the art in numerous fields; it has always been of an advanced nature and has, therefore, affected development greatly. In all of his work Dr. Conrad has been looked upon by his associates, as a leader. His accomplishments in one of the latest fields; namely, radio and television, would alone, in my opinion, entitle him to the award.

I, therefore, with great pleasure, endorse as strongly as I possibly can his nomination for the Lamme Medal.

Very truly yours,

(Signed) W. S. RUGG

Vice-president



C O P Y

FEDERAL RADIO COMMISSION

Washington, D.C.

November 5, 1928.

Dear Mr. Henline:

Replying to your letter of October 16th, I am very glad to give you a statement of my opinion regarding Dr. Frank Conrad's radio achievements. These have been of particularly wide scope.

Dr. Conrad's work in radio has been of a fundamental and at the same time practical character. Both of the outstanding advances in radio in recent years are in large measure due to his work. I refer to broadcasting and the uses of high-frequencies. Dr. Conrad pioneered in both of these fields.

I trust the foregoing brief statement is sufficient for your purposes.

Very truly yours,

(Signed) J. H. DELLINGER

Chief Engineer



2527

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS  
33 WEST THIRTY-NINTH STREET  
NEW YORK



TELEPHONE PENNSYLVANIA 6-9220  
CABLE, CYANDRIC

NOMINATIONS FOR 1932 LAMME MEDAL

*Renominated for 1933, 34, 35 and 36*

(Confidential - For Members of Lamme Medal Committee only)

---

FRANK CONRAD

Nominated by

H. P. Davis

For his pioneering and practical  
developments in electric metering  
and short wave radio transmission.

---

Supporting statements by:

H. P. Davis  
David Sarnoff  
W. D. Terrell  
J. H. Dellinger

S. M. Kintner  
W. S. Rugg  
C. E. Wilson  
C. E. Skinner





AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS  
33 WEST THIRTY-NINTH STREET  
NEW YORK

TELEPHONE PENNSYLVANIA 6-9220  
CABLE CYANDRIC

To the Press - For release  
March 1, 1937

LAMME MEDAL AWARDED TO

FRANK CONRAD

---

The 1936 Lamme Medal of the American Institute of Electrical Engineers has been awarded to Dr. Frank Conrad, Assistant Chief Engineer, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., "for his pioneering and basic developments in the fields of electric metering and protective systems." The medal and certificate will be presented to him at the annual Summer Convention of the Institute, which is to be held in Milwaukee, Wisconsin, June 21-25, 1937.

The Lamme Medal was founded as a result of a bequest of the late Benjamin G. Lamme, Chief Engineer of the Westinghouse Electric & Manufacturing Company, who died on July 8, 1924, to provide for the award by the Institute of a gold medal (together with a bronze replica thereof) annually to a member of the American Institute of Electrical Engineers, "who has shown meritorious achievement in the development of electrical apparatus or machinery" and for the award of two such medals in some years if the accumulation from the funds warrants. A committee composed of nine members of the Institute awards the medal.

Mr. Lamme made similar bequests to the Society for the Promotion of Engineering Education and the Ohio State University, providing in the former for the annual award of a medal "for accomplishment in technical teaching or actual advancement of the art of technical training", and in the latter for the annual award of a medal to a graduate of the Ohio State University in any branch of engineering for meritorious achievement in engineering or the technical arts. The three organizations adopted a common obverse for their medals, and each prepared a suitable reverse.

Previous awards of the Lamme Medal of the A.I.E.E. were:

1928 - Allen B. Field	1932 - Edward Weston
1929 - Rudolf E. Hellmund	1933 - Lewis B. Stillwell
1930 - William J. Foster	1934 - Henry E. Warren
1931 - Giuseppe Faccioli	1935 - Vannevar Bush

A biographical sketch of Dr. Conrad is attached.

---

H. H. HENLINE

National Secretary



DR. FRANK CONRAD, ASSISTANT CHIEF ENGINEER  
WESTINGHOUSE ELECTRIC & MFG. COMPANY

---

Dr. Frank Conrad, Assistant Chief Engineer of the Westinghouse Electric & Mfg. Company, prolific inventor, is noted for the design of equipment which has been a major factor in the development of the electrical industry and for his pioneering investigations into new fields which have broadened electrical knowledge.

More than 200 patents have been awarded Dr. Conrad in diversified lines, ranging from a.c. and d.c. electrical measuring instruments, arc lamps, systems of electrical distribution, auto ignition systems, mercury vapor rectifiers, radio telephony and telegraphy to electric clocks. This list covers only a segment of the field in which he has won achievement. His pioneering in radio telephony is credited with providing the idea which resulted in commercial broadcasting and he was associated in the development of much radio equipment including broadcasting transmitters, domestic radio receivers, microphones, and antennae. He also developed a new field in radio the use of short waves for long distance transmission.

Born in Pittsburgh, Dr. Conrad joined the Westinghouse organization as a boy of 16 in October, 1890. His natural aptitude for mechanics soon took him from his original work as a bench hand and he was placed in the testing department of the Company. His practical ideas gained him a place in an experimental and testing department directly under the manager. In 1897, he designed the so-called "Round-Type" watthour meter the forerunner of the modern watthour meter and which greatly decreased the size of previous square type meters and was more efficient. Dr. Conrad accomplished the reduction in the size of the meter by the use of a closed iron magnetic circuit which supplanted the use of an air circuit.

He then started the systematic redesign of all meters and instruments a work which improved their efficiency and in the course of which he developed a number of new types of instruments. Among them were the relay operated recording meter; power factor meters; electro-static voltmeter and ground detector which have not been improved upon since their development almost 30 years ago.

About 1910, Dr. Conrad started the development of a complete electrical system for automobiles including starting, ignition, and lighting. Some of the features Dr. Conrad included in his designs were the use of voltage regulated generators, automatic cut-off for the starting motor, a push-button type of remote control for the starting, which were in those early days far ahead of contemporary engineering. It is interesting to note that in 1937 the automobile industry has arrived at an universal use of voltage regulated generators.

In 1912 he began investigations into radio telegraphy and telephony, designing and building radio transmitting and receiving equipment a research which engrossed his attention for many years.



During this period he also worked on the problems of power distribution for alternating current railway systems. One of his contributions was the design of a resistance type breaker which curtailed the troubles which previously had resulted from short circuits and line surges.

The advent of the World War provided an outlet for much of his previous work with radio. His knowledge was sought and put to use in the manufacture of radio telegraph and telephone equipment for the U.S. Army and Navy. His contacts with these services in radio led to his design of grenades and grenade throwing devices and to other equipment which was sought at the time.

Because of his radio operations, he installed several transmitting stations, one of which was in his home, then in Wilkinsburg, Pa., a suburb of Pittsburgh. The close of hostilities left him with much equipment which brought to his mind an extended use of radio which had not yet been advanced. He started sending programs over the air and soon attracted a large audience. In 1920 Westinghouse inaugurated commercial broadcasting by the establishment of Station KDKA, whose transmitting equipment, antenna and microphone system were built by Conrad.

In charge of all radio operations, at the time, he supervised the development of newer transmitting equipment, the design of the famous Wd-11 tube operated from a dry cell and which made possible the first domestic radio receivers using tubes and other radio equipment required by the fast growing industry.

Later, his investigations into the characteristics of ultra-high radio frequencies led to the discovery of new possibilities concerning this field of radio. He learned that by use of the frequencies in the higher bands, radio could cover great distances with comparatively little power and that daylight did not affect them to the same degree as the lower frequencies of the broadcast band. In this way he opened up the short-wave field, now such an important part of radio operations.

Next he started the development of units for household refrigerating purposes and continued his work with electric clocks of which a battery operated type is now in extended use in modern automobiles.

Dr. Conrad is fond of all manner of studies and is well-informed in biology, astronomy and botany, to name those which chiefly interest him.

Dr. Conrad was given the honorary degree of Doctor of Science by the University of Pittsburgh in 1928. He was awarded the Morris Liebmann prize for 1925 by the Institute of Radio Engineers; The Edison Medal of the American Institute of Electrical Engineers for 1930; and the John Scott Medal of the City of Philadelphia in 1933; and now the Lamme Medal for 1936 by the A.I.E.E.

In 1904 Dr. Conrad was appointed general engineer and for many years served as assistant to the vice-president in charge of engineering. He was appointed assistant chief engineer in 1921.

He is a Fellow of the Institute of Radio Engineers; and a member of the American Institute of Electrical engineers, the Society of Automotive Engineers, and the American Association for the Advancement of Science. He is a Lieut. Commander of the U.S. Naval Reserve.

---



WESTINGHOUSE  
ELECTRIC & MANUFACTURING COMPANY  
EAST PITTSBURGH, PA.

FORM 16406 A



DR. CONRAD HONORED  
BY ELECTRICAL  
ENGINEERS

FOR PERMANENT RECORD  
FILE IN  
MEMBER FOLDER

RELEASE  
Monday  
June 21, 1937

Recipient of the Lamme Medal for 1936 of the American Institute of Electrical Engineers, Dr. Frank Conrad, assistant chief engineer of the Westinghouse Electric and Manufacturing Company is being honored for "his pioneering and basic developments in the fields of electric metering and protective systems."

Dr. Conrad will receive his award <sup>this morning</sup> ~~tonight~~ during convention proceedings of the A.I.E.E. now meeting in the Hotel Schroeder, Milwaukee.

As provided for in the will of the late B.G. Lamme, one of the world's foremost electrical engineers, the award is made annually to a member of the Institute "who has shown meritorious achievement in the development of electrical apparatus or machinery."

Previous recipients of the medal have been:

1928.....A.B. Fields

1932.....Edward Weston

1929.....R.E. Hellmund

1933 .....L.B. Stillwell

1930.....W.J. Foster

1934.....Henry E. Warren

1931.....G. Faccioli

1935.....Vannevar Bush

FOR PERMANENT RECORD  
FILE IN  
MEMBER FOLDER

(Eds.: Biography of Dr. Frank Conrad attached)

FOR PERMANENT RECORD  
FILE IN  
MEMBER FOLDER