

LETTERS

to the EDITOR

Sir:

. . . we published—probably the first in this country—a complete story on electrets in connection with microphones in our November, 1945, issue. . . .

HUGO GERNSBACH, Editor
Radio-Electronics

New York, N. Y.

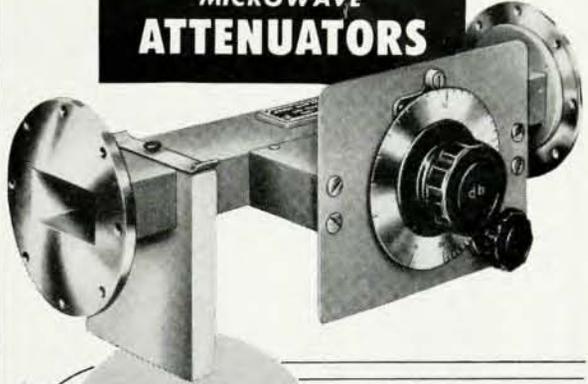
Both Dr. Ernst and the article in Radio-Electronics refer ultimately to Gemant's work in 1935; the operational characteristics of electret microphones were not described. Dr. Gemant states that he has a British patent on electret microphones which dates from 1935.

They Do Exist

Sir:

Dr. Gemant in his article Electrets in the March issue has given a very vivid picture of the electret and its many oddities, but his statement that "the electret . . . theoretically isn't supposed to exist" doesn't seem to be quite fair to theory and theorists. Certainly Heaviside did not feel so when he wrote his remarkable pages on Electrification. What can be ruled out on theoretical grounds is the existence of permanent *space* charges in any material. But the electret is characterized by the existence of *surface* charges, and there is nothing in the theory that speaks against the existence of "closed" systems with equal and opposite charges existing on adjacent surfaces. Electrochemical and contact potentials are examples. Another example would be, and probably is, a dielectric in a shortened capacitor carrying surface charges in consequence of the alignment of dipole systems. Provided the contact between the plates and the dielectric is intimate, these charges do not set up a field within the dielectric and, therefore, do not raise conduction currents to whisk them away. Thus these charges just cannot help stay on unless the dipole orientation responsible for them has decayed (and when the orientation has been 'frozen in,' this takes an astonishing long time) or until somebody wants to measure them and to this purpose opens the capacitor, lifts the plates, and

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thus brings about these obnoxious conduction effects mentioned above. In practice things are much more complicated in consequence of the homocharge effect, surface conduction, and surface breakdown, but these problems are much too controversial to be discussed here.

Being one of the few authors who have published several papers on the electret, I have come to take a more than professional interest in its existence and am very anxious to see that it is always given a fair deal.

B. GROSS

Rio de Janeiro, Brazil

Electret Microphones

Sir:

Andrew Gemant, in his article on Electrets in the March issue of *Physics Today*, states: "... electret microphones and their operational characteristics have not yet been mentioned in the technical literature." May I draw your readers' attention to the fact that the electret microphone has been protected for Mr. William A. Bruno, Astoria, N. Y., . . . by the American Patent No. 2,284,039 of May, 1942 . . . F. Gutman (in *Reviews of Modern Physics*) gives credit to A. Gemant for being the first to suggest the employment of electrets in condenser microphones . . . in 1935, but also mentions that the Japanese have used them rather extensively during World War II.

PAUL J. ERNST

Villanova, Pennsylvania

Stet

Sir:

I have noted in your correspondence columns a considerable amount of confusion concerning a reference, in an article written by me, to one "Max Karl Planck." It has been suggested that an unfortunate enallage in the picture of Dr. Planck involved also an error in the name of the subject of the picture. Permit me to call your attention to the name of the originator of the quantum theory, as printed on page 1191 of Webster's Biographical Dictionary. His name is given as "Max Karl Ernst Ludwig Planck." By the process of abbreviation, that would make him "Max Karl Planck." The only error in *Physics Today* was in printing the picture of Erwin Planck in place of the picture of Dr. Max Karl Ernst Ludwig Planck. I hope this makes everything very clear.

JULIUS C. C. EDELSTEIN

Washington, D. C.

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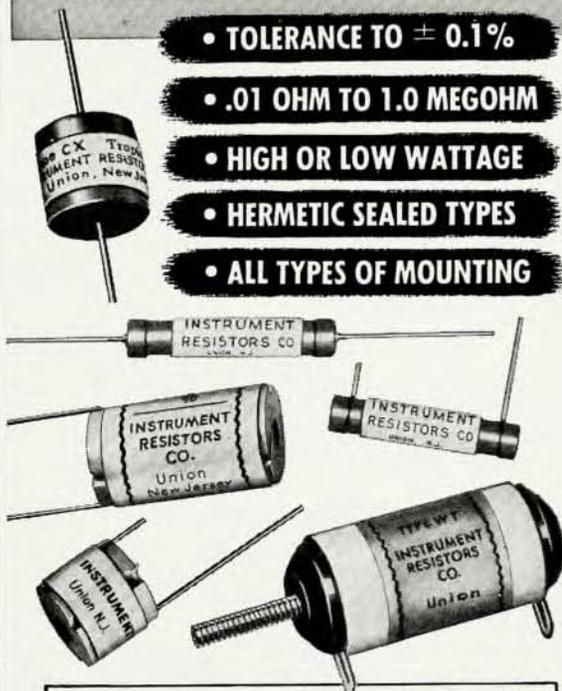
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