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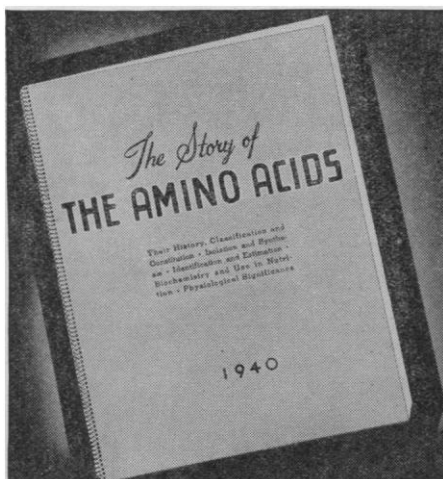
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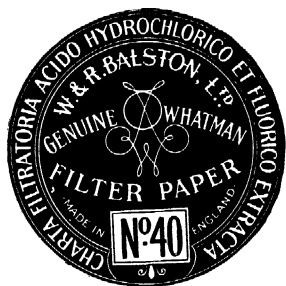


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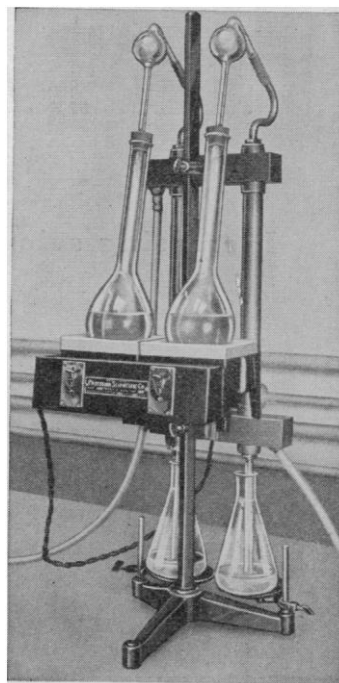
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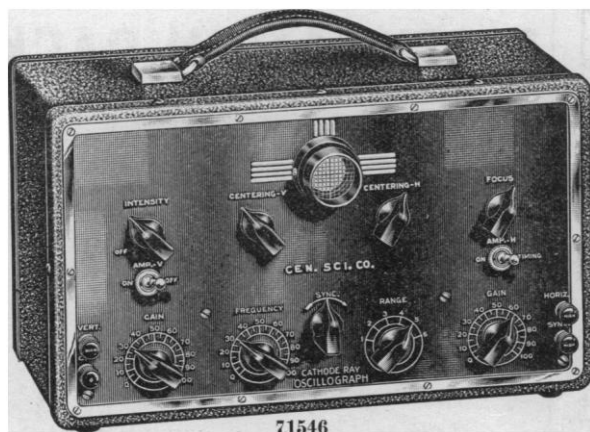
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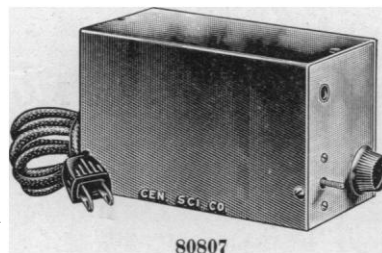
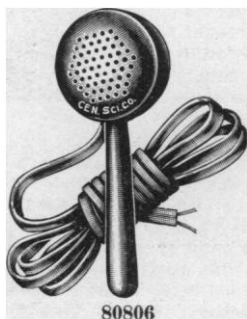
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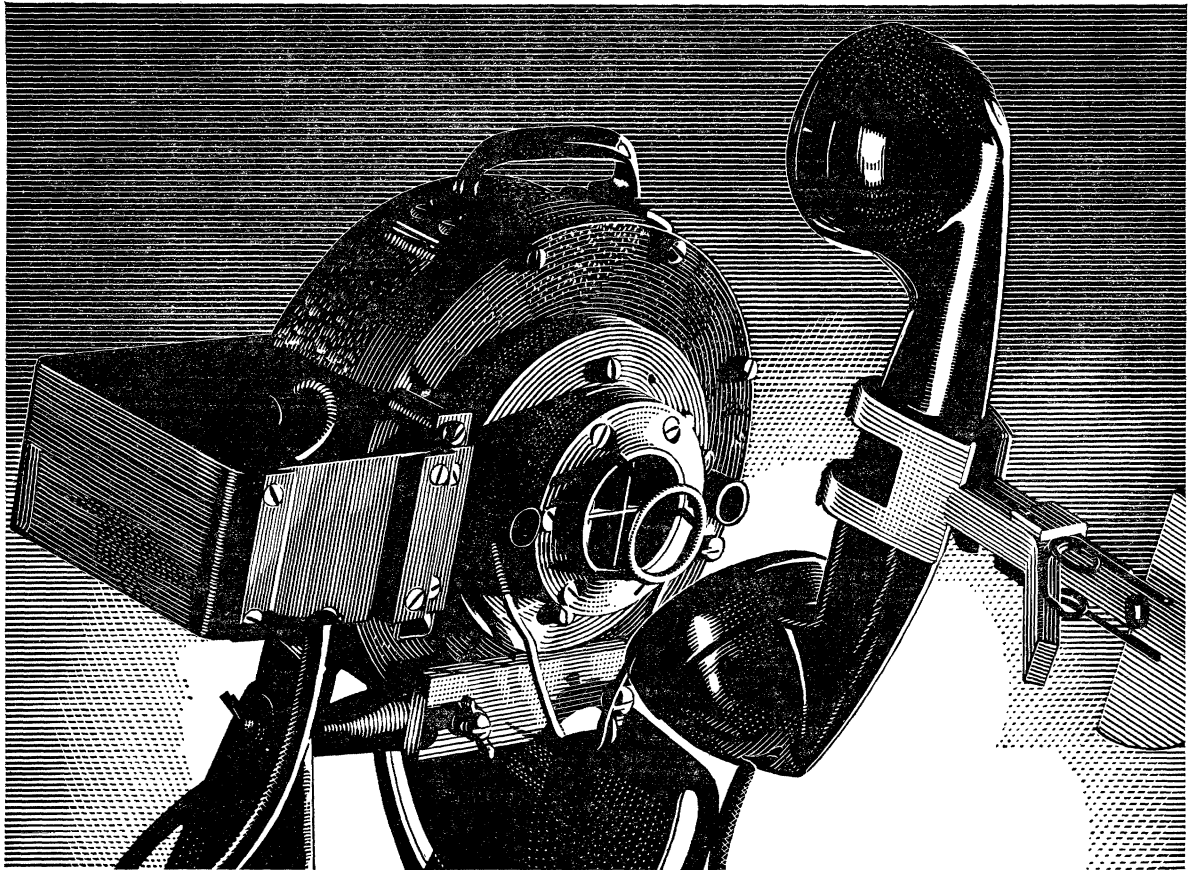
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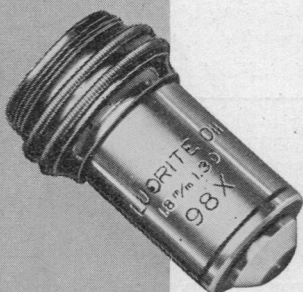
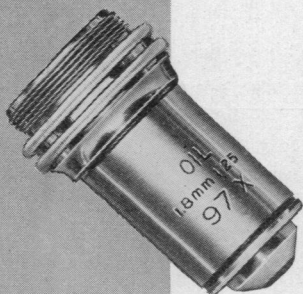
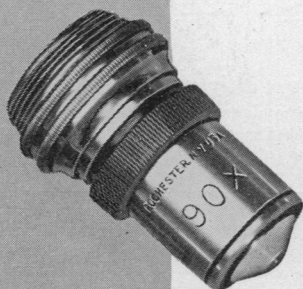
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VOL. 93

FRIDAY, JANUARY 3, 1941

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<i>The American Association for the Advancement of Science:</i>		
<i>The Body Physiologic and the Body Politic:</i> DR. WALTER B. CANNON	1	
<i>Obituary:</i>		
<i>Gladwyn Kingsley Noble:</i> PROFESSOR WILLIAM K. GREGORY	10	
<i>Scientific Events:</i>		
<i>The Union of American Biological Societies; Scientific Expeditions; High-Voltage Transmission Laboratory at Cornell University; The Industrial X-ray Unit of the General Electric Company; Grants of the Carnegie Corporation of New York</i>	11	
<i>Scientific Notes and News</i>	14	
<i>Discussion:</i>		
<i>A New Radioactive Series:</i> PROFESSOR WALTER WAHL and PROFESSOR ALFRED C. LANE. <i>Plans for the Future of the Virginia Academy of Science:</i> DEAN WORTLEY F. RUDD. <i>The Presentation of Scientific Papers:</i> FRANCIS H. ALLEN	16	
<i>Scientific Books:</i>		
<i>Sedimentary Petrography:</i> PROFESSOR ESPEL S. LARSEN. <i>Marine Shells of the Southwest Coast of Florida:</i> DR. PAUL BARTSCH	19	
<i>Special Articles:</i>		
<i>The Excretion of Specific Fluorescent Substances in the Urine in Pellagra:</i> DR. L. EMMETT HOLT, JR. and VICTOR A. NAJJAR. <i>Effect of Alcohol on Vitamin A Content of Blood in Human Subjects:</i> DR. SAMUEL W. CLAUSEN and OTHERS. <i>Ultraviolet Transmission by the Vitelline Membrane of the Hen's Egg:</i> DR. FRED M. UBER, TERU HAYASHI and VICTOR R. ELLS	20	
<i>Scientific Apparatus and Laboratory Methods:</i>		
<i>A Simple Apparatus for Pressure Filtration:</i> DR. ETHAN ALLAN BROWN and NORBERT BENOTTI. <i>An Electronic Relay with Improved Characteristics:</i> ROLAND C. HAWES	23	
<i>Science News</i>	10	
<i>Index to Volume XCII</i>	i	

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THE BODY PHYSIOLOGIC AND THE BODY POLITIC¹

By Dr. WALTER B. CANNON

GEORGE HIGGINSON PROFESSOR OF PHYSIOLOGY, HARVARD MEDICAL SCHOOL

At this bewildering time, when ancient customs are not respected, when new forms of society are being advocated and tried, when doubts cloud plans for present and future action, it is pertinent to inquire whether we might seek and find a social organization which would yield more of the benefits of security than we now enjoy. This search is natural. In the evolution and behavior of living beings the trend towards security has been one of the outstanding features. The oyster's shell, the bird's quick wings, the tiger's teeth and such human devices as clothing, houses and the varieties of insurance illustrate the universality of provisions for assured existence. The

¹ Address of the retiring president of the American Association for the Advancement of Science, Philadelphia, December 27, 1940. This essay is an elaboration of ideas expressed in an epilogue to a volume published in 1932, entitled "The Wisdom of the Body."

search for security is also important. In the relations among men in civilized nations there are many harrowing uncertainties. Industries are destroyed by inventions; business catastrophies create misery as hosts of laborers are suddenly thrown out of employment or realize that they hold precarious jobs; wars inflict on great populations death or painful and debilitating wounds and spread far and wide wretchedness and want. Under such stressful conditions masses of men may be led into precipitate and violent action. No wonder, then, that we look for a more stable society. Yet there are values we would not lose in the effort to gain greater stability of social organization. We would by all means wish to avoid the blight of a fixed rigidity of occupations or classes. We would wish also to avoid any check on human ingenuity directed towards advancing the welfare of mankind. Those

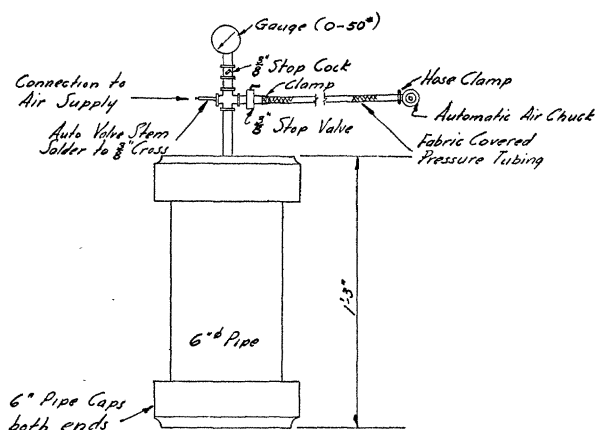


FIG. 1.

around, instead of through, the pad and so escape filtration. While the last charge is passing through the pad, it is best to release the air pressure in the filter chamber before all of the charge has passed through. With this technique, the pad remains moist and, since no air is forced through it, no foam is produced.

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There are now available new tube types which permit some improvement of this circuit, and which require about half as much power for operation. The latter is not negligible, since with continuous operation the power used costs roughly as much per year as the original price of the relay parts. Such a circuit is shown below. When AC operated, the current through the thermoregulator contacts is about one tenth of the peak current with the Hall-Heidt circuit and the maximum potential across the regulator is less than ten volts instead of 35.

¹ A. C. Hall and L. J. Heidt, *SCIENCE*, 92: 133, 1940.

² R. C. Hawes, *Ind. Eng. Chem., Anal. Ed.*, 11: 222, 1939.

The relay is adjusted by placing strap A about two thirds of the way up from the amplifier cathode on resistor R_1 (the adjustment is not critical) and straps B and C at the ground end of R_2 . B is then moved toward the cathode until the relay closes. C is moved toward B and the regulator circuit alternately shorted

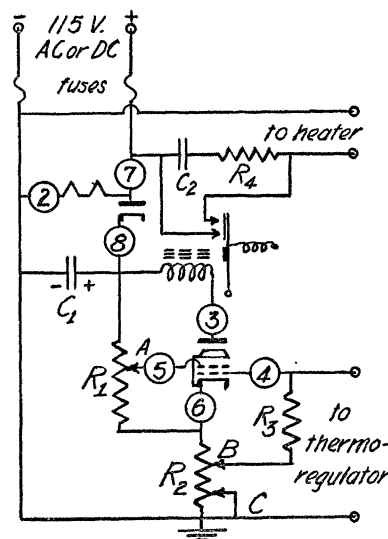


Fig. 1. Tube: 117N7-GT. Octal socket terminals are indicated by the encircled numerals. Terminal 1 has no connection. Relay: DC; 3,000. ohm, 20. milliamperes coil (Leach #1201, or equivalent). R_1 4,000. ohms, R_2 1,000. ohms. Both 10. watt, adjustable. An extra strap should be bought for R_2 . R_3 1. megohm, $\frac{1}{2}$ watt. R_4 100. ohms, 2 watt. C_1 8. microfarad, 200 v. electrolytic. C_2 0.5 microfarad, 400 v. paper.

and opened until C is as close to B as will permit the relay to open when the control circuit is shorted. Some leeway in these adjustments is advisable to allow for line voltage fluctuations. Care should be taken to connect the relay to the line with the proper polarity if, as is usual, one side of the line is grounded. The circuit may be used with a bimetal thermoregulator by interchanging the leads at B and C.

ROLAND C. HAWES

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By H. W. STONE, M. S. DUNN and J. D. McCULLOUGH, University of California at Los Angeles. *International Chemical Series*. 285 pages, $8\frac{1}{2} \times 11$. \$1.60

The effectiveness of this successful manual has been considerably strengthened in the new edition by the elimination of certain assignments and the addition of others, together with a number of important changes designed to improve the experiments. New problems have been added to many of the assignments to adapt the manual more closely to the needs of the technical student.

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