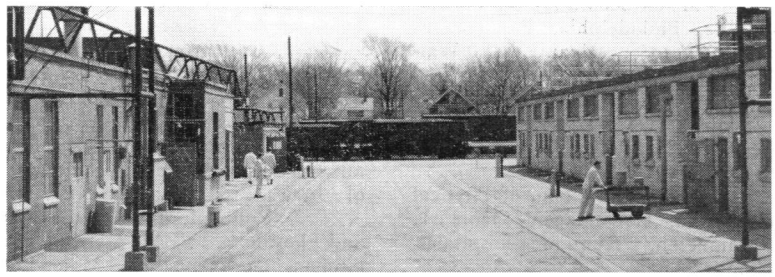
# Kodak reports to laboratories on:

**the genial chief control chemist across the road . . . how to make alignment decisions that don't take so much out of a man**

## That man



The building on the left houses our control lab, the building on the right some production labs.

The large drum in the cart contains o-iodobenzoic acid. This started out as *Anthranilic Acid* (Eastman 29, $2\text{-}NH_2C_6H_4COOH$). The production man had diazotized it, sandmeyered the diazonium group to an iodine, esterified the crude colored product with methanol, distilled the ester, hydrolyzed the colorless distillate back to the acid by treatment with alkali, neutralized the alkali with mineral acid, washed the precipitated product, dried it, and sent it across the road.

First thing the genial chief control chemist noticed when he got to this item was that it melted cloudy. The g.c.c.c. is a bear about cloudy MP's. This time his suspicions were confirmed. An acetone solution of the material is also a little cloudy. Obviously, something polar is present that shouldn't be. Back across the road the o-iodobenzoic acid is going, for removal of the trace of occluded salt that prevents the affixing of the white label reading *o-Iodobenzoic Acid* (Eastman 572).

The other drum contains 4-nitro-o-phenylenediamine. In a recent advertisement we offered an abstract of its use for the determination of $\alpha$-keto acids in blood and urine. A grateful public showered us with orders. This is the first lot in years made to fill an actual demand, which is better than a potential one. And here it is going back across the road, because that man thinks the MP is a mite low. Instead of blaming the calibration of his thermometer, he suddenly decided to see if the material gives a perfectly clear solution in 0.5N hydrochloric acid. It doesn't, so there it is on the cart. (More than a week the customers had to be stacked up while the stuff was being cleaned up. When last asked, the g.c.c.c. was positively enthusiastic about the quality of *4-Nitro-o-phenylenediamine* (Eastman 4323).)

*That is what you pay for when you buy Eastman Organic Chemicals. Part anyway. And there are some 3500 of them, ready and waiting. Distillation Products Industries, Eastman Organic Chemicals Department, Rochester 3, N. Y. (Division of Eastman Kodak Company).*

## No knots

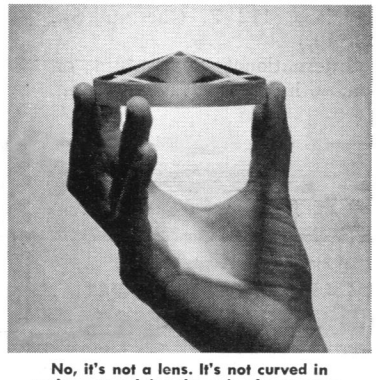
Take the Great Pyramid of Cheops at Gizeh. Take the Eiffel Tower. Take the *Nautilus*. Take one of those gigantic atom smashers. Take even a little thing like a million dollar turbine in a power generating station or a 70-foot planer bed. Always there comes a moment when the engineer-in-charge has to say, "OK, boys. She'll never be lined up any better than she is right now. Let's get on with the job." And the irrevocable next step is taken. Making a decision like that can take a lot out of a man.

Any gadget that puts such a decision on firmer ground ought to be worth quite a bit in peace of mind alone, to say nothing of the time cards of all those men standing around waiting, waiting for the word.

Right here we could make a big mistake by overplaying our hand. Let's better make plain where the new *Kodak Axicon* stands in relation to the art of aligning long axes.

The word "axicon" was coined by one of our chaps to designate a simple new class of axially symmetric optical elements, which, with the study of optics a couple of millenia old, he was lucky and smart enough to invent. An axicon images a point source of light along the axis as a straight line in space. No wire, however tight, can be so perfectly free of kink and sag. What of a telescope, you say?

A telescope objective forms its image at a different little knot in space for each successive target along the line of sight. In following these images with the cross hairs, there is a chance for error of parallelism between the focusing motion and the axis. There is also doubt about how much of the observed displacement is real and how much of it is parallax because of inability to locate the knots exactly. With an



**No, it's not a lens. It's not curved in a plane containing the axis of symmetry.**

axicon there is no focusing. Anywhere along a length of 40 feet—100 feet or more, if you like—the line of light is equally thin, forms an equally hard little point of light where intercepted.

*A procedure for aligning lower turbine shells with a* Kodak Axicon Aligner *has been worked out in full detail and even timed. The friends with whom we worked out this procedure certainly know the turbine trade as well as anybody alive. That they, with all their experience, like the axicon method encourages us to believe that the booklet prepared for their operating personnel might make interesting reading for others faced with awesome alignment problems. For a copy, write Eastman Kodak Company, Military and Special Products Sales, Rochester 4, N. Y.*

**This is one of a series of reports on the many products and services with which the Eastman Kodak Company and its divisions are . . . *serving laboratories everywhere***

Kodak
TRADEMARK

Poultry Husbandry, Texas A & M College, College Station.)

*9–18.* International Geographical Cong., 18th, Rio de Janeiro, Brazil. (H. O'R. Sternberg, Centro de Pesquisas de Geografia do Brasil, Faculdade Nacional de Filosofia, Av. Presidente Antonio Carlos 40, Rio de Janeiro.)

*10–11.* Minnesota Acad. of Science, New London, Minn. (B. O. Krogstad, Univ. of Minnesota, Duluth 5B.)

*12–17.* World Federation for Mental Health, 9th annual, Berlin, Germany. (Secretariat, 19 Manchester St., London W.1, England.)

*13–16.* National Medical Assoc., 61st annual, New York, N.Y. (J. T. Givens, 1108 Church St., Norfolk 10, Va.)

*15–22.* Canadian Teachers' Federation, Fredericton, N.B., Canada. (G. G. Croskery, 444 MacLaren St., Ottawa, Ontario, Canada.)

*16–21.* Symposium on X-Ray Microscopy and Microradiography, Cambridge, England. (W. C. Nixon, Cavendish Lab., Cambridge.)

*17–25.* International Cong. of Entomology, 10th, Montreal, Canada. (J. A. Downes, Div. of Entomology, Science Service Bldg., Ottawa, Ont., Canada.)

*19–23.* International Cong. on Diseases of the Chest, 4th, Cologne, Germany. (Executive Offices, American College of Chest Physicians, 112 E. Chestnut St., Chicago 11, Ill.)

*19–24.* International Symposium on Combustion, 6th, New Haven, Conn. (Combustion Symposium Office, Mason Lab., Yale Univ., New Haven 11.)

*20–21.* Mathematical Assoc. of America, 37th summer, Seattle, Wash. (H. M. Gehman, Univ. of Buffalo, Buffalo 14, N.Y.)

*20–21.* National Telemetering Conf., Los Angeles, Calif. (R. E. Rawlins, Lockheed Aircraft Corp., Burbank, Calif.)

*20–24.* Conf. on Scientific and Technical Writing, Philadelphia, Pa. (H. F. Arader, Univ. of Pennsylvania, 3400 Walnut St., Philadelphia 4.)

*20–24.* Institute of Mathematical Statistics, Seattle, Wash. (G. E. Nicholson, Jr., Dept. of Statistics, Univ. of North Carolina, Chapel Hill.)

*20–24.* International Cong. of Physical Medicine, 2nd, Copenhagen, Denmark. (S. Clemmesen, Kommune-hospitalet, Copenhagen.)

*20–25.* American Mathematical Soc., 61st summer, Seattle, Wash. (J. H. Curtiss, AMS, 80 Waterman St., Providence 6, R.I.)

*21–24.* Western Electronic Show and Convention, Los Angeles, Calif. (B. Angwin, General Electric Co., 11840 W. Olympic Blvd., Los Angeles 64.)

*22–29.* World Cong. of Sociology, 3rd, Amsterdam, Netherlands. (T. B. Bottomore, Skepper House, 13 Endsleigh St., London, W.C.1, England.)

*24–28.* American Astronomical Soc., joint with Astronomical Soc. of the Pacific, Berkeley, Calif. (J. A. Hynek, Harvard College Observatory, Harvard Univ., Cambridge 38, Mass.)

*26–1.* International Soc. of Haematology, 6th cong., Boston, Mass. (ISH, New England Medical Center, Harrison Ave. at Bennet St., Boston 11.)

*26–30.* American Inst. of Biological Sciences, Storrs, Conn. (H. T. Cox, 2000 P St., NW, Washington 6.)

*27–31.* Biological Photographic Assoc., 26th annual, Rochester, N.Y. (BPA, c/o 343 State St., Rochester 4.)

*27–31.* Colloquium on Statistical Mechanics of Transport Processes, IUPAP, Brussels, Belgium. (I. Prigogine, 40 Avenue F. D. Roosevelt, Brussels.)

*27–31.* Infrared Spectroscopy Inst., 7th annual, Nashville, Tenn. (N. Fuson, Dept. of Physics, Fisk Univ., Nashville 8.)

*28–2.* Colloquium on Semiconductors and Phosphors, IUPAP, Garmisch-Partenkirchen, Germany. (H. Maier-Leibnitz, Walter-von-Dyck-Platz 1, Munich 2, Germany.)

*29–5.* British Assoc. for the Advancement of Science, annual, Sheffield, England. (Secretary, BAAS, Burlington House, Piccadilly, London, W.1., England.)

*29–8.* International Soc. of Soil Science, 6th cong., Paris. (F. A. Van Baren, ISSS, Royal Tropical Inst., Mauritskade 63, Amsterdam, Netherlands.)

*30–5.* American Psychological Assoc., Chicago, Ill. (F. H. Sanford, 1333 16 St., NW, Washington 6.)

*30–5.* Psychometric Soc., Chicago, Ill. (L. V. Jones, Dept. of Psychology, Univ. of Chicago, Chicago 37.)



September

*1–9.* International Cong. of Anthropological and Ethnological Sciences, 5th, Philadelphia, Pa. (Secretary, American Organizing Committee, International Cong. of Anthropology, National Acad. of Sciences–National Research Council, 2101 Constitution Ave., Washington 25.)

*2–7.* Laurentian Hormone Conf., AAAS, Mont Tremblant, Quebec, Canada. (Committee on Arrangements, LHC, 222 Maple Ave., Shrewsbury, Mass.)

*4–5.* Meteoritical Soc., 19th meeting, Bloomington, Ind. (C. W. Beck, Dept. of Geology, Indiana Univ., Bloomington.)

*4–6.* International Assoc. of Milk and Food Sanitarians, annual, Seattle, Wash. (H. L. Thomasson, IAMFS, Box 437, Shelbyville, Ind.)

*4–7.* American Physiological Soc., Rochester, N.Y. (M. O. Lee, APS, 9650 Wisconsin Ave., Washington 14.)

*4–9.* American Ornithologists' Union, annual, Denver, Colo. (H. F. Mayfield, 2557 Portsmouth Ave., Toledo 13, Ohio.)

*4–11.* International Geological Cong., 20th, Mexico, D.F. (Congreso Geológico Internacional, Calle Balderas 36, Despacho 302-A, Mexico, D.F.)

*4–11.* International Paleontological Union, Mexico, D.F. (H. E. Vokes, Johns Hopkins Univ., Baltimore 18, Md.)

*5–7.* Wyoming Geological Field Conf., 11th annual, Moran, Wyo. (K. W. Frielinghausen, Box 1571, Casper, Wyo.)

*5–13.* International Cong. of Applied Mechanics, 9th, Brussels, Belgium. (H. L. Dryden, Director, National Advisory Committee for Aeronautics, Washington 25.)

*(See issue of 15 June for comprehensive list)*

## Equipment News

■ PHOTOVOLTAIC CELLS, their construction, and characteristics are elucidated in a booklet recently published by International Rectifier. Basic circuits that are utilized in the applications for these self-generating photocells are included, as well as information on the suggested scope of such applications. (International Rectifier Corp., Dept. Sci., 1521 E. Grand Ave., El Segundo, Calif.)

■ LABORATORY CLAMPS that are made of a high-tensile, corrosion-resisting aluminum alloy with a tensile strength of 45,000 lb/sq in. and a melting point of 1100°F are described in an 8-page bulletin just published by Labline. Items are included on burette supports, utility clamps, extension clamps, 3-prong universal clamps, clamp holders, set-up frames, column clamps, and stirrers. (Labline, Inc., Dept. Sci., 3070 W. Grand Ave., Chicago 22, Ill.)

■ NOISELESS BLAST-BURNER may be utilized to work Pyrex glass up to 75 mm in diameter and Vycor glass up to 25 mm. Selection of flame sizes and temperatures is made by manipulating two valves and without changing the instrument's tip. Since the gases are mixed and the fuel is burned externally, the body of the instrument remains cool. The burner is mounted on a ball-and-socket joint and maintains a pilot flame. (Fisher Scientific Co., Dept. Sci., 418 Forbes St., Pittsburgh 19, Pa.)

■ VARIABLE REACTANCE INSTRUMENT for the 8200 to 12,400-Mcy/sec frequency range has been developed. Rated at 300-kw peak power in matched line, the instrument is used to introduce a standing wave of desired magnitude and phase in a waveguide, and it operates directly at any power level up to the breakdown power level of the waveguide. The magnitude of the standing-wave ratio in the line can be varied from 1.02 to 2.0 by means of a micrometer adjustment on the top carriage. The phase of the standing wave is separately variable by the movement of the carriage. Phase adjustment is greater than half the waveguide wavelength at the lowest frequency. The phase scale offers direct reading to 0.5 mm with vernier reading to 0.05 mm. (Narda Corp., Dept. Sci., Mineola, N.Y.)

■ STIRRER is designed for general laboratory stirring but can also serve as a shaker drive for Van Slyke apparatus and separatory-funnel extractions. The instrument operates with speeds from 100 to 1200 rev/min in 11 discrete steps. The motor is controlled by a tapped autotransformer. (Gerald K. Heller Co., Dept. Sci., 1 N. Carey St., Baltimore 23, Md.)

■ SILICONE RUBBER COMPOUNDS are described in a recently published 8-page brochure that also provides data on the properties of silicone rubber in general and its resistance qualities under a variety of conditions. (Raybestos Manhattan, Inc., Dept. Sci., Passaic, N.J.).



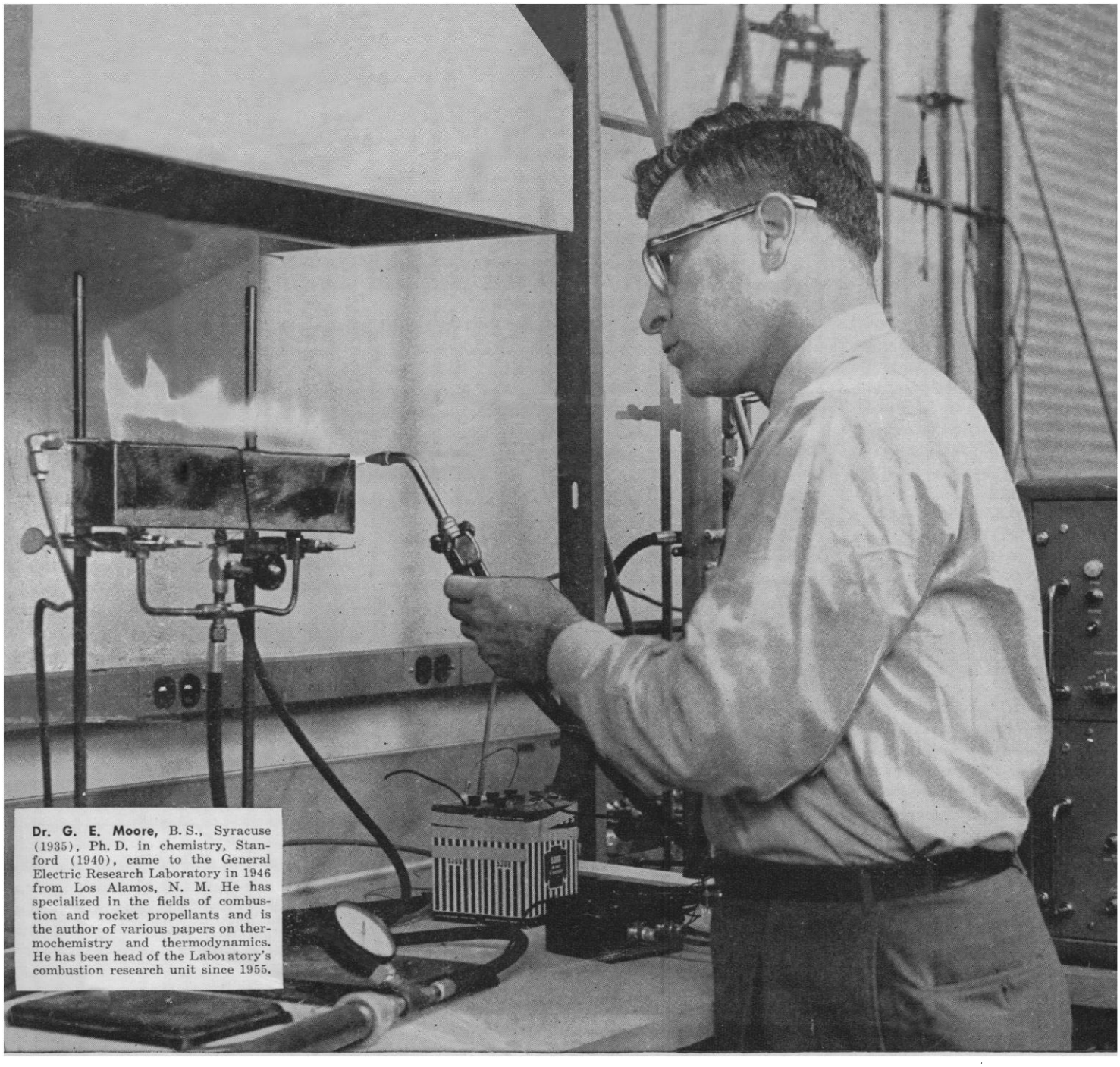
■ IMPREGNATED OPTOCHIN DISKS make possible a new test that provides differentiation between pneumococcus and streptococcus bacteria. The presence of pneumococci is revealed by a zone of inhibition. Results are read after 12-hr of incubation at 37°C. The disks may also be used for rapid identification of pneumococci in cultures in sputum, spinal fluids, and other organic fluids, and they remain stable when refrigerated. (American Hospital Supply Corp., Dept. Sci., Evanston, Ill.)

■ CARBON-14 COMPOUND, histamine (2-*ring*-C-14) dihydrochloride, has been added to the list of commercially available radioactive carbon compounds. This material is used in the study of amino-acid formation and metabolism, allergic reactions, and general body physiology. It is available at an activity of 1 mc/mmole. (Nuclear Instrument and Chemical Corp., Dept. Sci., 229 W. Erie St., Chicago 10, Ill.)

■ FRACTIONATOR collects liquid samples on a time basis that can be varied in four steps for the demonstration of changes in composition. Up to 30 test tubes are held under funnels in a Lucite disk that is rotated under the liquid source by a synchronous motor. (Edin Co., Inc., Dept. Sci., 207 Main St., Worcester, Mass.)

■ ULTRAMICROBALANCE for precise weighing of microgram quantities, has a sensitivity of 0.1 μg (or up to 0.001 μg on special order) and a load capacity that is 4 million times the sensitivity. The quartz-torsion balance can withstand shocks that would seriously damage a knife-edge balance. Quartz beam and torsion fibers are fused into a single unit. This construction makes possible positive duplication of weighings. The entire quartz system is gold-plated to aid in the dissipation of static charge. Pan holders are designed to support platinum pans, capillary tubes, or suspended objects. Space for tares is also provided. Special mountings to dampen vibration for reproducible weighings are not required. (Microtech Services Co., Dept. Sci., Box 121, Berkeley, Calif.)

■ ROTARY CONDENSER separates mixtures in the molecular weight range of 200 to 700. The new still features a glass column with an air-cooled rotary condenser and a dry-ice trap. During operation, distillate coming from the agitated surface of the pot is condensed by the rotating condenser and thrown to the upper, warm, evaporation surface where, under controlled conditions, it is re-evaporated and again condensed in the rotating condenser. Capacity of the still is 2 lit, and vacuum range is 0.1 μ-Hg. (Arthur F. Smith Co., Dept. Sci., Rochester 3, N.Y.)



**Dr. G. E. Moore,** B. S., Syracuse (1935), Ph. D. in chemistry, Stanford (1940), came to the General Electric Research Laboratory in 1946 from Los Alamos, N. M. He has specialized in the fields of combustion and rocket propellants and is the author of various papers on thermochemistry and thermodynamics. He has been head of the Laboratory's combustion research unit since 1955.

# Research for better rockets

## General Electric's Dr. George E. Moore applies basic studies of combustion to development of propellants

Behind the use of rocket motors in such devices as guided missiles and earth satellites is a history of painstaking research into the fundamentals of *combustion.* Dr. George E. Moore's contributions to this comparatively new science have included calculations of the effect of combustion-chamber size and shape on rocket efficiency, innovations in the use of fuels, and new understanding of the general chemistry of rockets. He and a group of General Electric associates have devised a new type of "hybrid" motor—using both liquid and solid fuels—that is a model of simplicity and efficiency in rocket propulsion and promises to play a significant role in what is certain to be a big future for rockets.

As General Electric sees it, providing individual scientists with freedom and incentive to solve the problems of research is part of solving the larger problem of how we can all live better, with better materials and better products with which to work, better jobs, and extra human satisfactions in terms of what people expect and want in life.

*Progress Is Our Most Important Product*

GENERAL ELECTRIC

## IMPROVED MODEL, FANZ

# MICROTOME KNIFE SHARPENER

**With electric motor drive and with *automatic* knife lifting and reversing device**

**Simplified operating and sharpening directions are printed in white lettering on both sides of hinged front door panel.**

**7203.** Showing hood removed from knife mechanism.

**MICROTOME KNIFE SHARPENER, Fanz, Improved Model 53.** With simplified, enclosed motor drive and with Miller automatic knife lifting and reversing device. Takes knives up to 325 mm in length and up to 13 mm thick. Provides more nearly perfect cutting edge than skillful hand honing and stropping.

A revolving glass disc, 21 inches diameter, is driven against the knife which is automatically swept to and fro in an arc through the center of the disc surface. In each operation, the automatic device sweeps the knife across the glass disc for approximately 27 seconds, during which period it makes 4.5 reciprocating cycles, and is then lifted, turned over and lowered to the disc in approximately 8 seconds, after which the process is repeated on the opposite side. A scale on the knife mechanism makes possible precise, reproducible setting of the angle of the bevel. Metal housing is 25 inches square x 11 inches high and is finished in attractive baked gray Hammertone enamel.

*An early model of this Sharpener has been in constant use for the past 23 years. During this period more than 16,000 knives sent to us for reconditioning have been sharpened on this machine without repairs excepting occasional replacement of a worn belt.*

**7203. Microtome Knife Sharpener, Fanz, Improved Model,** as above described, with Miller automatic knife lifting and reversing device, complete with glass disc, calibrated wooden wedge to facilitate adjustments; drip deflector, glass reservoir 2 liter capacity, plastic dust cover for glass disc, rubber and Tygon tubing connections, 1 lb. each of white rouge and castile soap, and detailed directions for use. For 115 volts, 50 or 60 cycles, a.c.----------**725.75**

***More detailed information sent upon request***

SYMBOL OF QUALITY
A.H.T.CO. SPECIFICATION
LABORATORY APPARATUS

***More and More Laboratories RELY ON THOMAS***

## ARTHUR H. THOMAS COMPANY

*Laboratory Apparatus and Reagents*

**P. O. BOX 779** **PHILADELPHIA 5, PA.**

**Teletype Services: Western Union WUX and Bell System TWX PH-72**