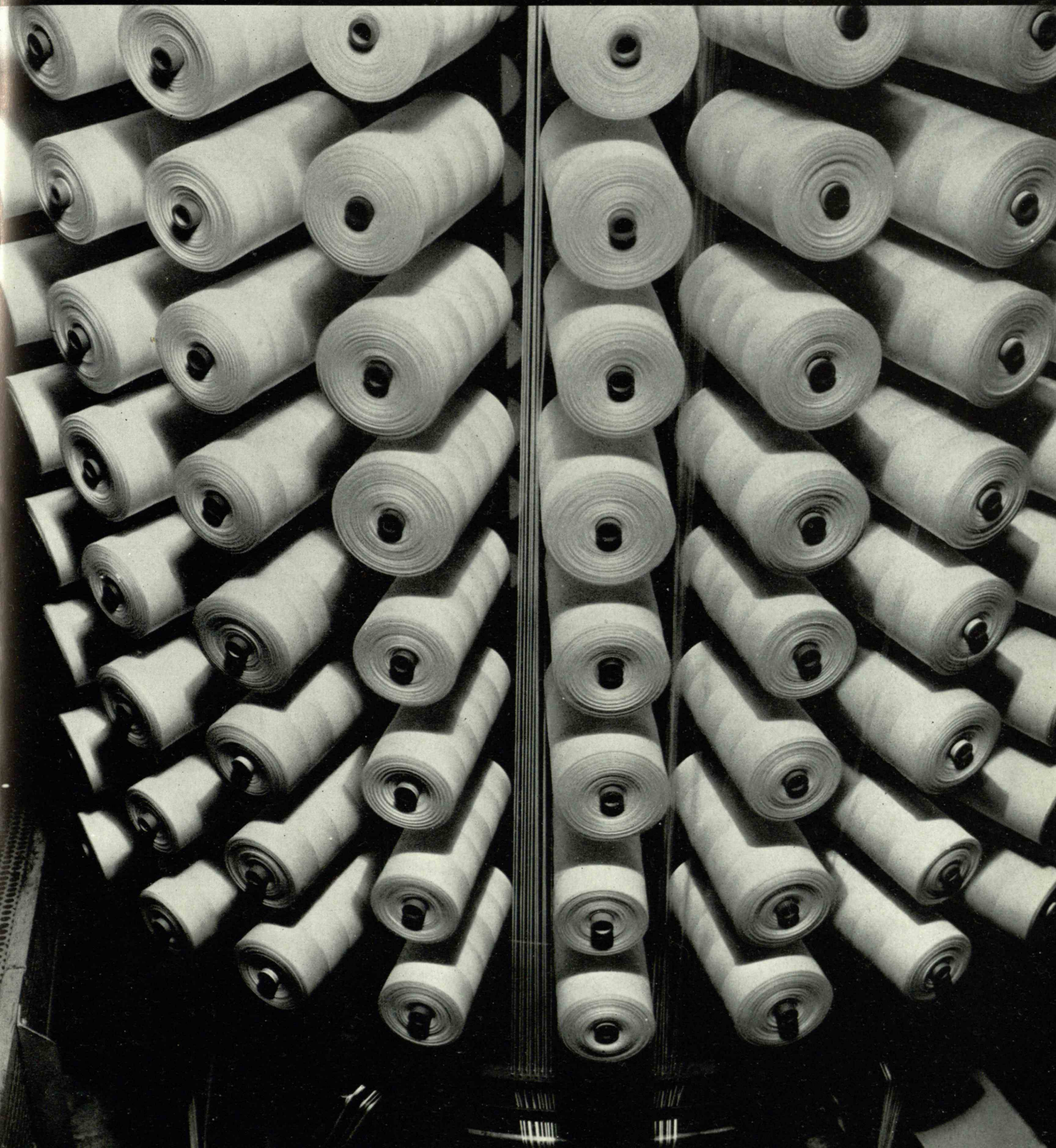


*June* 1938

# TECHNOLOGY REVIEW

Title Reg. in U. S. Pat. Office







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## THE TABULAR VIEW

BECAUSE of the close partnership that has grown up in recent years between the physicist and the physician, The Review has devoted an increasing amount of space to their joint activities. An example is the article in this issue, "Exploring the Body with Atoms," by PHILIP M. MORSE (page 353), Professor of Physics at the Institute and a member of The Review staff. As President Compton pointed out in a recent address, the relation of physics to medicine can be traced historically through the interesting changes in the connotation of the word *physics*. The root meaning of physics is "that which pertains to nature or that which is in accordance with the laws of nature." The word was used originally to designate phenomena of the natural and material world as contrasted to things mental, moral, spiritual, or imaginary. It therefore referred to phenomena of living things, including the human body, as well as phenomena of the inanimate world. Later its meaning was narrowed, and in turn various branches of the natural sciences, such as biology, astronomy, chemistry, and geology, were excluded. It is interesting, however, to note that today in Webster's dictionary a physicist is defined not only as a specialist in natural sciences but as one versed in medical sciences. At least the philologists, then, still recognize the physicist's connection with the physician. Striking, too, is the fact that in France the physicist is called a *physicien*, which is almost exactly our own word for a medical practitioner. In Germany he is called *physiker*, and you may or may not know that a physicker as defined in the English dictionaries is "one who administers a physic." Despite these philological vagaries and the long separation of the physicist and physician, it is becoming increasingly clear, and Professor Morse shows it in his article, that the progress of modern science has again brought the two professions together. We see on every hand that the physicist, with his increasing knowledge and control of the forces of nature, is bringing these materials and forces more and more to the service of the physician for the curing of sickness and the preserving of health.

READERS of The Review may recall a letter published in this column last February, requesting an article explaining the mysteries of geophysics. That letter was read by a reader of The Review in Texas who wrote air mail to the Editor asking if he might provide such an article. He received an equally prompt reply asking him to proceed. The name of this alert geophysicist is ROLAND F. BEERS, '28, and his by-line appears over the article on page 356, entitled "The Great Detective Story." He is president of the Geotechnical Corporation at Dallas, Texas, and he holds a bachelor's degree from Rensselaer and a master's degree from M.I.T. Once before he appeared in The Review, writing on the same subject and under the title "Doodle-Bugs Deposed" (May, 1931). ¶ In "This Ball of Clay—How Old?" published by (Concluded on page 342)

No. 8

*Just for Fun!*

## A CHALLENGE

TO YOUR INGENUITY

CONSIDER the gambling device which rolls three dice simultaneously. You place your bet on any selected die number—say "2". If, in the roll, "2" turns up, you get your money back, plus one, two or three times the amount of your bet, depending on the number of times "2" appears. If "2" does not show, you lose your money.

Since there is 1 chance in 6 that "2" will turn up on any *one* die, *three* dice would appear to provide 3 chances in 6 of winning. This would leave 3 chances in 6 of losing and make the gambling odds 50/50. Actually the odds are 108/125. Can you explain?

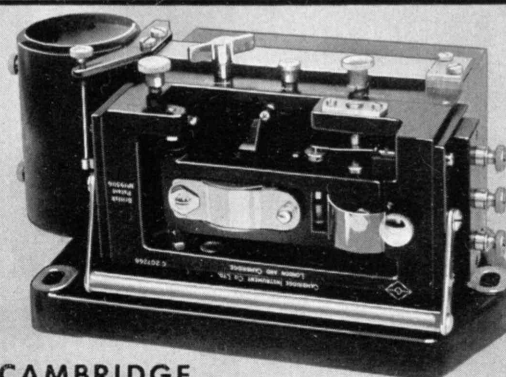
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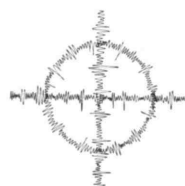
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UNIVERSAL VIBROGRAPH



By a simple interchange of parts, this instrument may be adapted to recording of vertical or horizontal vibrations, for measuring torsional accelerations and bridge deflections.

When arranged as a portable unit, vibrations are communicated to a recording mechanism by bringing a toe into contact with the vibrating body. It employs the stylus-on-celluloid method of recording.

*Send for descriptive literature*

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# PRESSURE WIND TUNNEL

## for M.I.T by P·DM\*

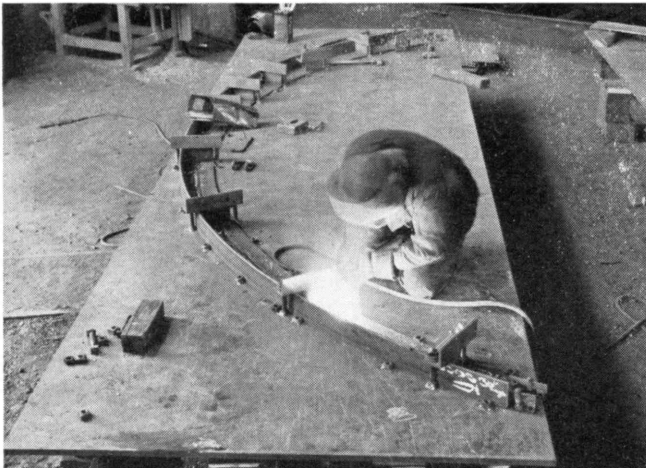


Above is shown one of the large corner girders for the new wind tunnel, lying horizontally on the steel welding floor. Welds in heavy steel assemblies cause distortions which are largely eliminated by clamping such assemblies rigidly to the heavily reinforced and anchored welding floor. This elliptical corner girder will be erected in a vertical position; the curved vanes which may be seen in the illustration serve to change the direction of the rapidly moving air in the tunnel through an angle of 90 degrees. This method of turning air has been found to be most efficient, producing less eddy and a more uniform air velocity of the tunnel cross-section than any other known method.

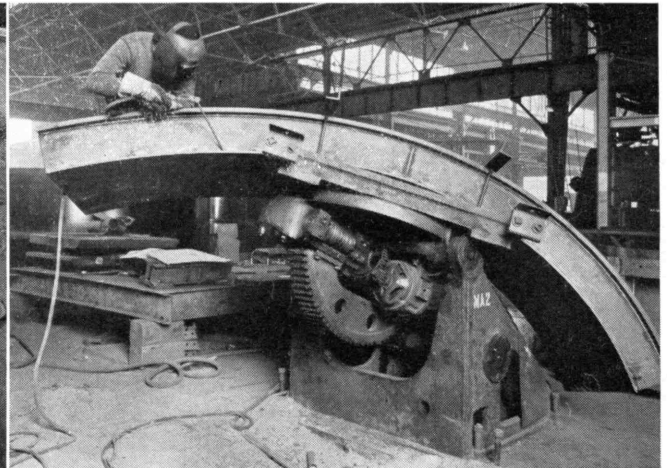
THE winds that blew at Kitty Hawk are but remotely akin to the controlled hurricanes that will dwell in the Wright Brothers Memorial Wind Tunnel.

In building this newest instrument of aeronautical research, P·DM employs the skill acquired during more than 40 years of exacting steelcraft, for science and industry the country over.

Illustrated and briefly described are a few interesting details of the work in progress . . .



A P·DM welder is here seen joining a curved angular shape and a curved flat bar together to form one of the circumferential stiffeners which will give the new wind tunnel sufficient strength to resist external pressure, when the tunnel is partially exhausted to make tests of models under rarefied atmosphere. These welders are expert in directing the flow of molten metal from the electrodes, so that the finished bead has a regular and uniform appearance resembling a jeweler's pattern.



This is a section of one of the smaller elliptical girders on the welding manipulator. The purpose of this machine is to position the fillet or joint being welded so that the welding may be done at the highest practical speed. This machine rotates through about 135 degrees on the horizontal axis and 360 degrees on the normally vertical axis, which enables any part to be positioned so that the welding may be done in the down direction. Since welding may be compared to pouring molten steel into a seam, the importance of proper positioning may readily be appreciated.

## \* PITTSBURGH • DES MOINES STEEL COMPANY

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Designers, Fabricators and Erectors of:

ELEVATED STEEL TANKS  
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Structural Steel and Alloy Platework for all Standard and Special Purposes



No business stands alone. Every business has mutual interests with others—a fact which is strikingly illustrated in the purchasing activities of Western Electric.

*Samuel Bloom*  
PRESIDENT

## 13,000 Sources of Supply

**W**ESTERN ELECTRIC as manufacturer and purchaser for the Bell System buys large quantities of materials of all kinds—more than \$90,000,000 worth in 1937.

The Company bought these materials from more than 13,000 different sources of supply, thus benefiting many businesses, large and small, and creating employment for thousands of people.

In its purchasing policy, Western Electric recognizes a dual responsibility—

1. To buy at prices which are fair to the Bell System and hence to you as a telephone user.
2. To buy at prices which are fair to the seller, so that he can continue as a dependable source of supply.

This policy is typical of those under which the Bell System operates.

# *Western Electric*

BELL SYSTEM SERVICE  
IS BASED ON  
WESTERN ELECTRIC QUALITY

# Alumni Day at Technology

*Commemorating on June 6 the Final Departure of the Institute  
from the Rogers Building*

## THE PROGRAM

June 6, 1938

### Morning

8:30 A.M.—10 A.M. REGISTRATION in the main lobby of the Rogers Building, 491 Boylston Street

8:30 A.M.—12:30 P.M. RETROSPECTIVE EXHIBITION of work in the School of Architecture, Main Exhibition Room, Rogers Building

10 A.M.—12:15 P.M. SYMPOSIUM, Huntington Hall, Rogers Building

### The Impact of Science on the Arts

#### Speakers

WILLIAM EMERSON, *Dean of the School of Architecture*, welcoming guests to Rogers and introducing:

A. LAWRENCE KOCHER, '13, *Editor, Architectural Record*, presiding

WALDEMAR B. KAEMPFFERT, *Science Editor, New York Times*

*Title: "Science and Society"*

JOHN MILLS, '09, *Director of Publications, Bell Telephone Laboratories, Inc.*

*Title: "Engineering and Art"*

MALCOLM COWLEY, *Literary Editor, New Republic*

*Title: "Technology and Letters"*

FREDERICK J. KIESLER, *Director of Laboratory for Design Correlation, Columbia University*

*Title: "Biotechnics and Architecture"*

12:15 P.M.—12:40 P.M. FAREWELL TO ROGERS, Huntington Hall. Address by Charles-Edward A. Winslow, '98

12:40 P.M.—1 P.M. Transfer of activities to M.I.T. in Cambridge. Bus service from the Rogers Building to Cambridge will be provided

*The entire program of the Symposium will be heard on an international short-wave broadcast from Station W1XAL of the World Wide Broadcasting Foundation, Boston, a non-profit organization which is supported by contributions from interested friends and listeners. This broadcast will be sent out on a wavelength of 6.04 megacycles (49.6 meters).*

### Afternoon

1 P.M.—2 P.M. LUNCHEON in Du Pont Court, M.I.T., Cambridge

1 P.M.—5 P.M. EXHIBITIONS in the Main Lobby and adjacent areas:

- (1) The growth of an industrial design
- (2) Modern mass-produced articles

(3) Streamlining in fact and fancy

(4) Selected photographs under the auspices of The Technology Review

2 P.M.—4 P.M. JOINT CLASS DAY EXERCISES with the Class of 1938 in Lowell Court. Alumni speakers: For the Class of 1888, WILLIAM G. BESLER, *Chairman of the Board, Central Railroad of New Jersey*; for the Class of 1913, LAURENCE C. HART, *General Sales Manager, Johns-Manville Sales Corporation*

4 P.M.—4:15 P.M. Adjourn to the steps of the new Architecture Building on Massachusetts Avenue

4:15 P.M.—4:35 P.M. DEDICATION of the new home of the School of Architecture

4:45 P.M. DEDICATION of the new Davis R. Dewey Memorial Library in Room 5-330

### Evening

6:30 P.M.—10:30 P.M. STEIN-ON-THE-TABLE DINNER at the Hotel Statler, Boston

#### Speakers

MARSHALL B. DALTON, '15, *Retiring President of the Alumni Association*

KARL T. COMPTON, *President, M.I.T.*

JOHN MULHOLLAND, *Authority on Magic*

*Address and demonstration on "Science and Magic"*

## Program for the Ladies

IT is expected that the morning symposium, the buffet luncheon, the afternoon exhibition will all be fully as attractive to the ladies as to the gentlemen.

9 A.M.—1 P.M. Room 16 in the Rogers Building will be put at the disposal of the ladies, and for those who do not care to attend the events in Rogers, the Emma Rogers Room in Cambridge will be open from 9:30 on

3:45 P.M. Open House at the home of Mrs. Karl T. Compton

4:45 P.M. Busses leave Mrs. Compton's for a short sight-seeing trip through Cambridge on the way to The Country Club, Brookline

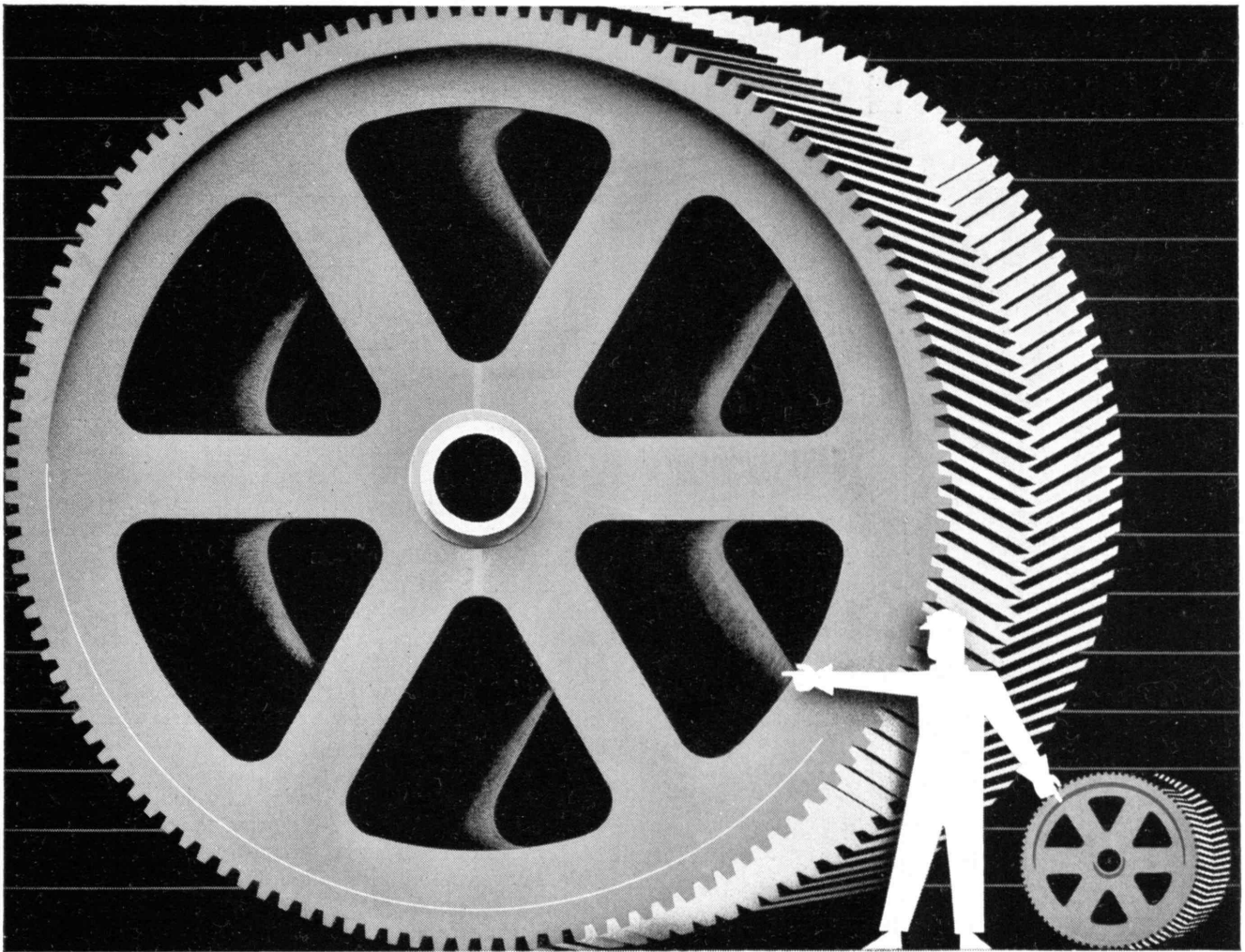
6 P.M. Dinner, The Country Club, Brookline

7:30 P.M. Return by bus to the Statler Hotel to participate in the evening's entertainment there

*Note that the morning program is in the Rogers Building, 491 Boylston Street, Boston. Go there to register. One final word: The Banquet is not to be missed. It's to be a new departure in Technology festivals and it's included in the blanket ticket costing only \$5.00.*

*You are invited and urged to join other Technology Alumni in this stimulating and entertaining program "... for it's always fair weather when good fellows get together ..."*





## DIFFERENT IN SIZE . . . ALIKE IN STEEL

It's a big jump from a 36-inch gear to one of 16 feet weighing 53,000 pounds. Yet their case histories show that such widely varying sizes can be handled with one steel. In these instances a Manganese-Molybdenum (0.15 to 0.20% Mo) steel was used.

In the large gear simple annealing, normalizing and drawing proved sufficient to produce uniformly good physical properties. The smaller gear permitted oil quenching and drawing to even higher physical

properties. And, despite the wide variations in sections, no casting defects or machining difficulties were encountered in either of the two products.

Such is the versatility of Moly cast steels. Our free book, "*Molybdenum in Steel*," tells more about them; and our accumulation of practical field data is available to engineers and production executives toward the solution of any specific iron or steel problem. Climax Molybdenum Co., 500 Fifth Ave., N. Y.

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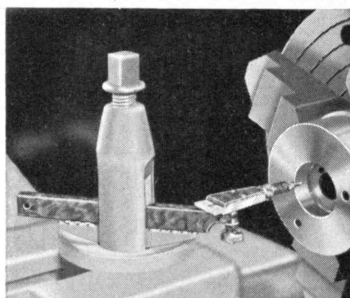
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It is sensitive, accurate, flexible, adaptable to practically every conceivable indicating operation and sells for only five dollars. Contact point which is frictionally held in rotating sleeve can contact work at any angle. Indicator can be mounted on side or top of shank or clamped to jaw of height gage. Indicator is 2½ inches long, shank 5 inches. Range, .012 by thousandths.

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Standardize on  
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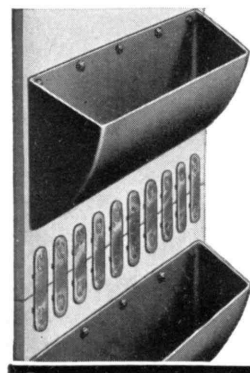
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Conveyor and  
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Note how recessed plates compress belt end. Internal friction and ply separation in belt ends is overcome. The tight butt of the belt ends prevents passage of materials or liquids through the belt. Made in steel, "Monel Metal," non-magnetic and abrasion resisting alloys. Five sizes. Sold by jobbers and belting houses. Consultation regarding belt joining invited.

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**FLEXIBLE STEEL LACING CO.**  
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Sold throughout the world



## THE TABULAR VIEW

(Concluded from page 337)

The Review last April, Professor Morse described how the "pure" geophysicist is exploring the interior of the earth. Mr. Beers's article is a sequel that describes the work of the "applied" geophysicist in the workaday world of oil exploration. ¶ Each year a score or more of M.I.T. juniors and seniors compete for the Stratton Prizes, monetary awards given for excellence in the oral presentation of scientific papers, and this year the Editor, much to his surprise, derived a great deal of pleasure from judging the semifinals of this contest and he also pounced upon one of the papers as a pertinent article for The Review. This is the article, "Should I Trade in My Car?" by VERNON G. LIPPITT, '38 (page 372). Mr. Lippitt, as an outstanding senior, this year received a Rogers scholarship and he now has the added distinction of being, with possibly one exception, the first undergraduate to have a formal article appear in this stately and learned family journal. Mr. Lippitt, we might add, placed third out of six in the final judging for the Stratton Prizes.

FROM a reader of The Review who shall go unnamed, we have received the following letter: "After several weeks of cautious investigating in a field to which I had never before given the least attention, I recently decided to purchase a \$225 phonograph-radio, with record changer and all the trimmings, for the purpose of enjoying classical piano music at home. Just as I was ready to write the check and turn in the order . . . I happened to read the editorial comment in the April number of The Review, page 258, to the effect that after five playings the first flower of the tone quality is gone from these recordings, after 25 the needle hiss increases in prominence, and after 100 the records are completely washed up. This had the effect of sending me into a state of complete estivation, as far as that purchase was concerned. I should be interested to learn, if you care to state, whether the several manufacturers of phonographs have contested your editorial statement; also whether the new needle suspension developed at the Cruft Laboratory and mentioned in the same editorial statement is to be made available to the public within a reasonable period." ¶ We are chagrined that the article in The Review halted this gentleman in his plan to equip his home to play records. We have recently done it ourselves, despite the needle hiss and despite the obvious wearing of the records. These we are willing to bear because we want music when we want it, but at the same time we anxiously await better phonographic equipment — equipment that is kind to tender records and that is not designed mainly for people with tin ears. ¶ The statements in The Review's article were correct so far as we have been able to determine and have not been challenged. Those who wish more information about the pickup developed at the Cruft Laboratory are referred to Professor F. V. Hunt of Harvard University, who will gladly supply further information.





*Electricity's eyes never close . . . its service is never asleep*

A BABY'S cry in the night . . . a midnight prowler . . . sickness that strikes in the dark. How grateful we may well be in emergencies for the never-failing service of electric light! Yet how few of us realize what it takes to make that service possible — what it has cost over the past 50 years in the way of investment, invention, engineering, and human toil.

Trace the wires from your light switches, and you will find them

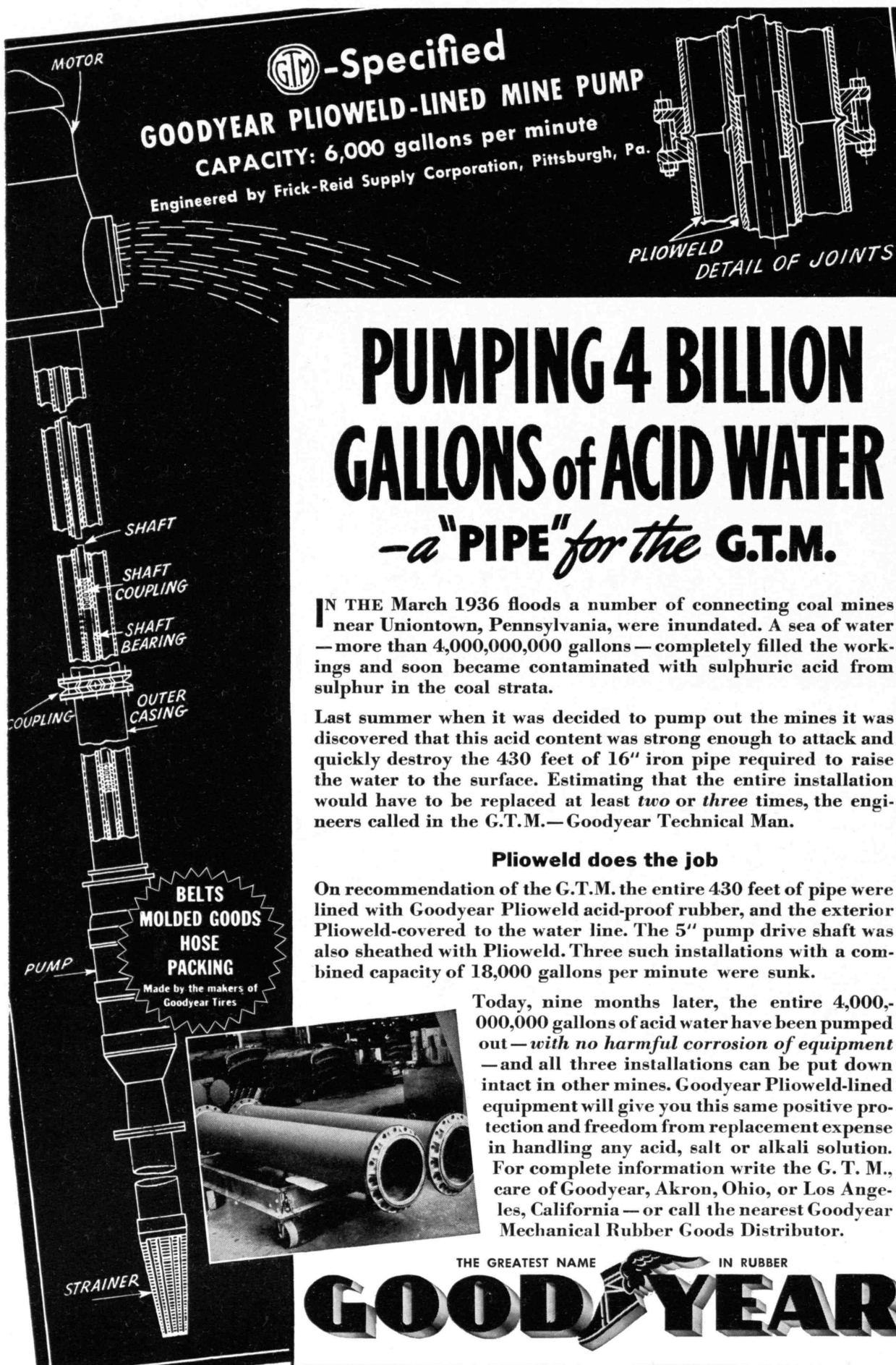
connected to an intricate system of transformers, protective devices, transmission lines, substations and generating plants that cost millions to build. To keep such systems functioning day and night, through heat and cold, storm and flood, costs millions more. Vast additional sums go yearly into research, development, and improvement. Electric service can never be called "perfect," because it is always being made better and cheaper!

Westinghouse contributions to this progress have helped to blaze the trail of electricity from its source to its infinite uses. The generating systems — the transformers and networks — the lamps that burn longer and brighter at less cost — all owe something to Westinghouse co-operation with progressive power companies. This partnership in the public interest is of direct benefit to every industry, business office, farm and home in America.

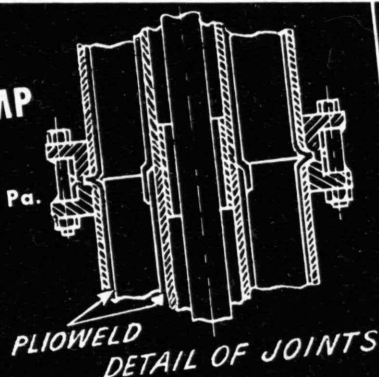


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**GOODYEAR PLIOWELD-LINED MINE PUMP**  
**CAPACITY: 6,000 gallons per minute**  
Engineered by Frick-Reid Supply Corporation, Pittsburgh, Pa.



# PUMPING 4 BILLION GALLONS of ACID WATER —a "PIPE" for the G.T.M.

IN THE March 1936 floods a number of connecting coal mines near Uniontown, Pennsylvania, were inundated. A sea of water—more than 4,000,000,000 gallons—completely filled the workings and soon became contaminated with sulphuric acid from sulphur in the coal strata.

Last summer when it was decided to pump out the mines it was discovered that this acid content was strong enough to attack and quickly destroy the 430 feet of 16" iron pipe required to raise the water to the surface. Estimating that the entire installation would have to be replaced at least *two* or *three* times, the engineers called in the G.T.M.—Goodyear Technical Man.

## Plioweld does the job

On recommendation of the G.T.M. the entire 430 feet of pipe were lined with Goodyear Plioweld acid-proof rubber, and the exterior Plioweld-covered to the water line. The 5" pump drive shaft was also sheathed with Plioweld. Three such installations with a combined capacity of 18,000 gallons per minute were sunk.

Today, nine months later, the entire 4,000,000,000 gallons of acid water have been pumped out—with *no harmful corrosion of equipment*—and all three installations can be put down intact in other mines. Goodyear Plioweld-lined equipment will give you this same positive protection and freedom from replacement expense in handling any acid, salt or alkali solution. For complete information write the G. T. M., care of Goodyear, Akron, Ohio, or Los Angeles, California—or call the nearest Goodyear Mechanical Rubber Goods Distributor.

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