Pease Products
Blue Printing Equipment
Drawing Instruments
Drawing Tables
Drawing Boards
Draftsmen's Stools
Tracing Paper and Cloth
Blue Print Paper
Filing Cabinets
Drafting Room Supplies
Surveyor's Instruments

Precision to the Nth Degree

Pease Drawing Instruments are manufactured of the very finest materials obtainable by the most skilled workmen it is possible to hire. Conditions in our factory are conducive to getting intensive effort from the workmen and the result is a line of American Made Instruments which are not surpassed by any drawing instrument, foreign or domestic, in precision, balance, durability, utility and finish.

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The C. F. Pease Company
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The Difference Between "Bushings" and BUNTING Bushing Bearings

There was a touch of black magic in the making of bronze bushing bearings when William Bunting poured his first moulds 62 years ago.

He carried the formulas for his alloys in his head and in a little memorandum book which was never out of his possession. He gained his knowledge through years of patient endeavor, success and failures.

Today his three sons and their sons manufacture Bunting Bushing Bearings in a great plant that gives scientific precision to the unique and exclusive methods originated by three generations of one family working constantly at one specific task.

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Toledo Ohio

BRANCHES AND WAREHOUSES

New York Chicago Cleveland
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Your Heating and Plumbing Problems

Our competent engineers are always ready to consult and advise you on any of your heating and plumbing problems.

And whether the undertaking is large or small, you may be sure that you will receive the same prompt and courteous attention.

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The Units of Equipment which Help, rather than Hinder, in the successful completion of any work, are those of correct design and careful building.

Units produced by The Hadfield—Penfield Steel Co., of Bucyrus, O., are so built and include—

- **Diesel Engines**
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**DIESEL ENGINES**—Product as much power on one car of oil as can be developed from ten cars of coal under boilers. No shoveling of coal or ashes. One-tenth freight. Cost starts when work starts.

**GASOLINE LOCOMOTIVES**—Built in several sizes. Economic motive power at minimum cost. No skilled help. Low upkeep cost.

**CLAY WORKING MACHINERY**—Full equipment for making every product made of clay. Also cement machinery.

**ONE MAN GRADER**—Attaches to a Fordson in an hour. One man cuts grading cost to one-fourth. Grades, scrapes, ditches, removes snow.

**CRAWLER TRACKS**—Make a Crawler of any Fordson. Doubles its pulling power. Goes anywhere. Ford service and low upkeep.

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Whatever your "Choice of a Career," college training has increased your economic value, and whatever business or profession you enter, adequate life insurance is a proper self-appraisal of your powers in that direction.

The traditions, practices, and financial strength of the JOHN HANCOCK Mutual Life Insurance Company are such that a college man can take especial pride in having a John Hancock policy on his life. It is also a distinct asset from the start. It will pay you to buy it; and later on, should you think of joining the field corps of this company, it will also pay you to sell John Hancock policies. Our representatives will tell you just how, and assist you in selecting both your career and your insurance.

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Now insuring One Billion Seven Hundred Million Dollars in policies on 3,250,000 lives

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One pinion, one gear, two shafts; detachable thrust bearing. As accessible as a brick machine can be built. We also build the Union Machine—an augur machine and a pug mill in one construction.

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Producing the highest grade face brick, without repressing. Equally satisfactory for commons and pavers. Several hundred in successful operation.

We manufacture a complete line of auger machinery, having given our attention exclusively to this one class of machinery for over forty years.

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DEPENDABLE MACHINERY OF PROVEN EFFICIENCY
Good Friends from now on

There's good news at the plant. The production engineer and the chief inspector have buried the hatchet—their feud is ended—and all because of Ground-Form Cutters.

For months Jones, the engineer, thought that big Mac, the chief inspector, was rejecting gears in order to give production a black eye.

"They're good gears, Mac," protested Jones. "What's the matter with them?"

"Sure they're good, if you take them one by one," replied Mac, "but in big lots they're not uniform enough to pass inspection."

And so the war began; Mac grew more careful, and Jones felt sure that Mac had a personal grudge against him.

Then Jones discovered Brown & Sharpe Ground-Form Gear Cutters. He heard that they would increase production and at the same time improve the quality of his gears. He tried a few. Now, all his gear cutting machines are equipped with Ground-Form Gear Cutters.

Mac and Jones are good friends now. Gears come through faster than ever and rejections are few and far between.

Here is the booklet that proved so valuable to Jones. You can avoid his difficulties by getting acquainted with Ground-Form Cutters before the full responsibility of production falls on your shoulders. Write today for your copy of this instructive booklet.

BROWN & SHARPE MFG. CO.
Providence, R.I., U.S.A.

Better lighting needed in industrial plants.

In a paper read before the Illuminating Engineering Society, February, 1920, entitled, "A Survey of Industrial Lighting in Fifteen States," R. O. Earman submitted some very interesting data regarding the lighting conditions in industrial institutions. The survey comprises some 446 institutions, in which lighting was considered by 55.4% as being vitally important, and by 31.6% as being moderately important, and by 13% as being of little importance. Practically 58% considered that lighting was as important as power in the operation of the plant, and a small proportion would give more attention to lighting than to anything else.

In considering the present condition of lighting as found in the various plants, only 9% ranked as excellent, about 3/4 ranked as good, 29% fair, 18.8% poor, 3.5% very poor, and 7.8% partly good and partly poor. It was found that the lighting in the offices was far superior to that in the shops; 19% being excellent, 36% good, 31% fair, and only 13% poor and none very poor.

On consulting the executives regarding what factors were most important in considering lighting, the following facts were revealed: Increase of production 79.4%, decrease of spoilage 71.1%, prevention of accidents 59.5%, improvement of good discipline 51.2%, and improvement of hygienic conditions 41.4%. Manufacturers who have good lighting appreciated its value largely from the standpoint of its stimulating effect upon output.

There is no question that any intelligent man who carefully considers the necessity for good lighting in an industrial plant, will agree that it is impossible for a person to do as good work, either in quality or quantity, in poor light as in good light, but yet the result of a careful analysis discloses the fact that only about 40% of industrial plants are furnishing good light to their workers and 60% are operating under poor lighting. It is hard to understand why such a proportion of concerns can be satisfied with a condition which is universally admitted to be a curtailer of efficiency and a prolific cause of accidents. The principal cause of this condition is that those in charge of such establishments have not given the attention to lighting that it demands. They do not know what constitutes good lighting, and in their absorbing interest of other factors of production have overlooked a vital one.

Every safety official should deeply interest himself in the lighting of his plant and insist upon good lighting as much as good goggles, good guards and other necessary accident prevention equipment. Every production manager should insist upon good lighting because the efficiency of the working force is increased by the condition of the lighting furnished. The plant physician should examine the lighting, for eye strain and eye fatigue are directly affected by poor lighting, as is the hygienic condition. Well lighted plants are invariably cleaner than poor lighted places. Plants equipped with Factrolite Glass in all windows are well lighted.

If you are interested in the distribution of light through Factrolite, we will send you a copy of Laboratory Report—"Factrolited."

MISSISSIPPI WIRE GLASS CO.,
220 Fifth Avenue,

BETTER LIGHTING NEEDED IN INDUSTRIAL PLANTS.

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Vol. 14 contains ten authoritative text-books (as shown in the illustrations on this page), published by the Hercules Powder Co., which tell in detail, with illustrations and diagrams, how, when and where to use various explosives most economically and efficiently and explain the development of dynamite from its origin to the present day.

The booklet on Flotation is especially interesting to mining engineering students who wish to know about the concentration of ore by the use of flotation oils.

In the booklet entitled Hercules Explosives and Blasting Supplies you will find a complete list of Hercules publications to date, any of which will be sent you on request. Furthermore, if there is any special subject connected with blasting which is not fully covered in these books, The Hercules Powder Company Library will gladly furnish you with a bibliography on receipt of your letter addressed to 941 King Street, Wilmington, Delaware.
A Record Still Unbroken

At 5:20 P. M., March 8th, 1920, Westinghouse Turbine Established World's Record for Continuous Running.

What Engineering Owes to Good Workmanship

WHEN Westinghouse installed a 45,000 K. W. Turbine in the power house of the Narragansett Electric Light Company, Providence, R. I., early in December, 1919, there was no thought of more than the average weekly power house run. Abnormal weather conditions, however, brought so steady a demand for power, that the unit was not shut down until March 8th, 1920, after a continuous run of 84 days, 11 hours, and 36 minutes.

This was especially remarkable in that the unit consists of two turbine generator sets, each of which operates independently of the other, so that the result was the mechanical equivalent of operating a single machine continuously for 169 days.

If space permitted, many astounding figures could be cited—about the K. W. H. generated during this period, the water and coal used, the cooling system, the oiling system, etc.

For example, to keep the generators cool, over 18,000,000,000 cubic feet of air passed through them, which equals 2,000 times the total weight of the generators and their bed plates.

Equally impressive, oil was pumped through the self-contained lubricating system to the bearings at the rate of 600 gallons a minute. Had the oiling system failed for only 30 seconds, the bearings would have been wrecked, and other parts of the unit harmed!

There is interesting history back of the operation of Westinghouse Turbine Units of 3,000 K. W. and higher. Notable records have been made in many of the world's great power plants, performance that is a tribute to remarkable engineering and good workmanship.

Westinghouse

ACHIEVEMENT & OPPORTUNITY
MICHAEL FARADAY
1791-1867
Apprentice to an English bookbinder. Attracted the attention of Sir Humphrey Davy, becoming his assistant. "The greatest experimentalist of all times," says one biographer. The electrical unit Farad was named for him.

"What's the use of it?"

Michael Faraday saw the real beginning of the age of electricity nearly a century ago when he thrust a bar magnet into a coil of wire connected with a galvanometer and made the needle swing.

Gladstone, watching Faraday at work in his laboratory, asked, "What's the use of it?" The experimenter jestingly replied, "There is every probability that you will soon be able to tax it." The world-wide use of electricity that has followed the Faraday discovery abundantly justifies the retort to Gladstone.

Faraday's theory of lines of force is constantly applied in the Research Laboratories of the General Electric Company in devising new electrical apparatus of which Faraday never dreamed. Every generator and motor is an elaboration of the simple instruments with which he first discovered and explained induction.

GENERAL ELECTRIC