



IN MR. EDISON'S CHEMICAL LABORATORY.
His chief chemist at work on an experiment.

The Modern Profession of Inventing in America

THE TWO KINDS OF INVENTOR AND THEIR METHODS—HOW MR. EDISON, THE TYPE OF THE INDEPENDENT EXPERIMENTER, GETS HIS WONDERFUL RESULTS—THE RISE OF "INVENTIONS DEPARTMENTS" IN GREAT INDUSTRIES—HOW THEY CREATE NEW DEVICES.

By FRENCH STROTHER

THE complicated machinery of modern business has produced two types of inventor. One is the freelance energetic and ingenious enough to create marketable inventions sufficient to maintain his financial independence. The other is the "inventions department": the idea factory, or inventive brain of a great business: made up of a number of unknown units—men who have enough ingenuity and enough ideas to hold a salaried position as part of the creative organization of a manufacturing company.

The best-known example of the independent inventor is Mr. Thomas A. Edison. This strange man, so simple in personal

appearance and manner, so extraordinary in his habits of life and methods of work, moves among his complicated series of shops and experiments with such mental precision and constructive energy, yet appearing to do so without any sense of order or system—a sort of volcanic intellectual chaos—that he is the despair of all the men who try to analyse him. But he has no sentimental notions about an invention. When an idea occurs to him his first question is: "If it can be done, is it worth anything?" If it will not pay he has no use for it. Inventing is his business: the thing he invents must be worth money.

The instant he decides that the idea is

worth while, he sets in motion his extraordinary method of developing it. Some time ago, for example, he needed a chemical mixture that should have two properties that are rarely found together in the same compound. He might have set a chemist to work to figure out from the known science of chemistry, what would be most likely to fill the requirements, and so narrow the problem down to one of trying a few chemicals. What he did was to take Watts's Chemical Dictionary, in several ponderous volumes, and get his assistants to make every chemical mixture in it that could even conceivably serve his purposes, and try every one of the thousands.

"Out of the lot, I found about seven compounds that worked," said Mr. Edi-

But inventors of this type form but a small part of the real profession of inventing. The great majority of practical inventions are made by a group of men of whom the public never hears. These men are members of one of the most complicated and highly organized of the modern professions. Every great manufacturing concern maintains, under one name or another, an "inventions department," employing men who are paid various salaries simply to develop inventions. They are supplied with every mechanical appliance to facilitate their work; the bills are paid by the company, and every invention they make is assigned to the company "in consideration of salary, and one dollar." The General Electric Company, at Schenectady, N.Y., for example,



MR. CHARLES P. STEINMETZ, THE CHIEF ENGINEER OF THE GENERAL ELECTRIC COMPANY, NEW YORK, AND HIS LATEST INVENTION.

A Model of his Mercury Arc Current Rectifier.



MR. THOMAS A. EDISON,
The greatest of the independent inventive geniuses.

son, "but when I finished the experiments I know beyond a doubt that those seven were the only ones that could be made for that purpose."

He became interested in radium. The scientists had described certain substances as being those in which the presence of radium could be detected by sensitive photographic plates. Mr. Edison was not satisfied. He took 7000 plates, put a sample of fifty different substances on each plate, and locked them up for seven weeks in a dark room. At the end of that time he had the plate developed, and found that practically every one of the 350,000 specimens showed traces of the presence of radium.

This, then is his method—to take nothing for granted, to believe that anything may be possible, and then to try everything conceivable in the hope of hitting on what he needs. To see him moving through his great laboratories, head bowed, hands in pockets, his face set in an expression of intense mental preoccupation, his hair carelessly combed whichever way it may please to fall, his eyes focussed miles away except when he flashes into someone else's a look of instant understanding, his whole appearance, except for the eyes and the humorous yet grim mouth, is that of a dreamer rather than of a tireless worker. Yet this is the man who, eating practically nothing and exercising not at all, works often for thirty-six hours without sleep, falls unconscious from exhaustion on bench or desk, and wakes to work again, sometimes for a week without unrelaxing electrical with mental energy; marvelous in the power of his mental imagination. This is the popular idea of what an inventor is—a man of dreams and action in one, possessed by an idea that harasses him until it be delivered in finished form.

employs about 800 men who devote much of their time to developing new ideas. It spends \$500,000 a year in this development work. The Westinghouse Companies do the same thing; so does every progressive manufacturing concern of any consequence in the United States. And it is these unknown men, grappling with the everyday, practical problems of great manufactories, who make most of the inventions of immediate commercial value.

THOMAS A. EDISON—INDEPENDENT INVENTOR.

Mr. Edison has very definite ideas about inventing as a profession. When asked to describe the personal qualifications and the type of mind necessary for an inventor, Mr. Edison said:

"The point in which I am different from most inventors is that I have, besides the usual make-up, the hump of



AT WORK ON A DESIGN FOR AN ARC LAMP.

In the model shops of the General Electric Company, New York.