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VARIOUS LEADERS OF INDUSTRY



by EDWIN
WILDMAN





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FAMOUS LEADERS
OF
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BY

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GREAT WAR



BY

EDWIN WILDMAN

FAMOUS LEADERS of INDUSTRY



THE PAGE COMPANY

53 BEACON STREET, BOSTON, MASS.





THOMAS ALVA EDISON

(See page 115)

FAMOUS LEADERS

OF

INDUSTRY

THE LIFE STORIES OF BOYS WHO HAVE SUCCEEDED

By

EDWIN WILDMAN

Editor of *The Forum*, author of "Reconstructing
America—Our Next Big Job," "Aguinaldo,
A Narrative of Filipino Aspirations," etc.

Illustrated



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AN ACKNOWLEDGMENT

This book is written from the best sources of information available. To secure the early struggles of the FAMOUS LEADERS OF INDUSTRY was a difficult task. In assembling data the most authoritative sources were sought out, and the facts wherever possible verified by those who are in a position to pass upon the material. If any errors have crept into the volume, they are the errors of the source and not of the writing.

In the preparation of this exhaustive study of men, the author wishes to acknowledge the assistance of Mr. Alfred E. Keet, associate editor of the FORUM Magazine, whose careful and studious collaboration and research have been of valuable assistance, and contribute to the accuracy of the stories of these, our FAMOUS LEADERS OF INDUSTRY.

EDWIN WILDMAN.

INTRODUCTION

Boys, these are stories of boys, perhaps like yourselves — young, ambitious, full of grit and anxious to make of your lives a success, both in earning money, building a business, and gaining honor and prestige among your fellows.

Success is a hard road, as you will learn in reading of the struggles, obstacles overcome, disappointments and unremitting devotion to their ambition of these FAMOUS LEADERS OF INDUSTRY.

They did not live joyless lives; they found pleasure in their work, because they *loved their work* and hoped to get on in the world. In preparing these stories I have chosen mostly boys in different lines of work, all of whom succeeded in the business world, so that whatever is your bent you may find help and inspiration in the success of some other boy who commenced at the bottom and worked, round by round, to the top.

The conditions in the business world of to-day are not quite the same as they were when these boys were young. But remember, the principles of success — the persistency of purpose, the zeal for hard work and the necessity of putting in it your love of it, and your energy for it — are the same. The opportunity is as great to-day. The undeveloped resources of this great country are calling for boys with brains and ambition.

INTRODUCTION

Science has opened up new fields, the increasing population is offering larger markets, and our broadening trade, extending into all parts of the world, beckons the boys of to-day to prepare themselves for the tasks and opportunities that await them.

This is a great country, the country of greatest opportunity; a country that provides education in every vocation; and jobs and ownership and control await the boys who are fit and who make the fight for success.

What others have done, you can do — never forget that — and make your life a success by beginning early and never letting up until recognition and compensation are yours, by the work wrought by your own hands and brains.

EDWIN WILDMAN.

CONTENTS

	PAGE
PHILIP DANFORTH ARMOUR <i>California Pioneer and Chicago Packing King</i>	3
P. T. BARNUM <i>The World's Greatest Showman</i>	17
ALEXANDER GRAHAM BELL <i>Immortal Telephone Inventor, and Humanitarian</i>	37
JOHN M. BROWNING <i>The Gun Wizard and Inventor of the Machine-Gun</i>	51
WILLIAM ANDREWS CLARK <i>Montana Copper King and United States Senator</i>	67
WILLIAM L. DOUGLAS <i>The Boy Who Pegged Shoes and became Governor</i>	81
JAMES BUCHANAN DUKE <i>American Tobacco and Cigarette King</i>	93
GEORGE EASTMAN <i>Who Invented the Kodak and Popularized Photog- raphy</i>	105
THOMAS ALVA EDISON <i>Electrical Wizard and World's Greatest Inventor</i>	115
HENRY FORD <i>The Aladdin of the Automobile Industry</i>	131
CHARLES GOODYEAR <i>Inventor of Vulcanized Rubber</i>	147
HENRY JOHN HEINZ <i>Pittsburgh Pickle King and Sunday-School Leader</i>	157
CYRUS HALL MCCORMICK <i>Inventor of the Reaping Machine</i>	167
HUDSON MAXIM <i>Poet, Philosopher, and Wizard of High Explosives</i>	181
JOHN H. PATTERSON <i>The Industrial Genius Whose Ruling Passion has been to make things "go better"</i>	195

	PAGE
JOHN DAVISON ROCKEFELLER	213
<i>Oil King and World's Greatest Industrial Leader</i>	
CHARLES M. SCHWAB	229
<i>Steel King and Submarine Boat Builder</i>	
ISAAC MERRITT SINGER	247
<i>Inventor of the Sewing Machine</i>	
LOUIS FRANKLIN SWIFT	259
<i>Head of the World's Largest Meat-Packing Business</i>	
JOHN WANAMAKER	271
<i>America's Foremost Retail Merchant and Originator of the Department Store</i>	
GEORGE WESTINGHOUSE	285
<i>Inventor of the Railroad Air-Brake</i>	
JOHN NORTH WILLYS	297
<i>Wizard of Autos and Airplanes</i>	
FRANK W. WOOLWORTH	311
<i>Magician of the 5 and 10 Cent Store</i>	
ORVILLE AND WILBUR WRIGHT	327
<i>Who achieved immortal Fame as Airship Inventors</i>	
LINUS YALE AND HENRY R. TOWNE	341
<i>Who Revolutionized Lock-Making</i>	
ADOLPH ZUKOR	353
<i>Motion Picture Magnate</i>	

LIST OF ILLUSTRATIONS

	PAGE
THOMAS ALVA EDISON (<i>see page 115</i>)	<i>Frontispiece</i>
PHILIP DANFORTH ARMOUR	3
PHINEAS TAYLOR BARNUM	17
ALEXANDER GRAHAM BELL	37
JOHN M. BROWNING	51
WILLIAM ANDREWS CLARK	67
WILLIAM L. DOUGLAS	81
JAMES BUCHANAN DUKE	93
GEORGE EASTMAN	105
HENRY FORD	131
CHARLES GOODYEAR	147
HENRY JOHN HEINZ	157
CYRUS HALL McCORMICK	167
HUDSON MAXIM	181
JOHN H. PATTERSON	195
JOHN DAVISON ROCKEFELLER	213
CHARLES MICHAEL SCHWAB	229
ISAAC MERRITT SINGER	247
LOUIS FRANKLIN SWIFT	259
JOHN WANAMAKER	271
GEORGE WESTINGHOUSE	285
JOHN NORTH WILLYS	297
FRANK W. WOOLWORTH	311
WILBUR WRIGHT	327
ORVILLE WRIGHT	334
LINUS YALE	341
HENRY R. TOWNE	346
ADOLPH ZUKOR	353
JESSE L. LASKY	357

PHILIP DANFORTH ARMOUR
CALIFORNIA PIONEER AND CHICAGO
PACKING KING



PHILIP DANFORTH ARMOUR

FAMOUS LEADERS OF INDUSTRY

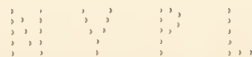
PHILIP DANFORTH ARMOUR

CALIFORNIA PIONEER AND CHICAGO PACKING KING

DIGGING ditches and building sluices for gold mines at \$5 a day — or \$10 a night — in a California gold rush city was the way nineteen-year-old Philip Danforth Armour, founder of Armour & Company, started his long and successful business career.

Young Armour had walked all the way to the Golden State from his home in Stockbridge, New York, in six months, dodging Indians and suffering great privations, sometimes nearly starving. Sluice building was less romantic than delving for elusive gold, but in the main it paid better. Sometimes the young man worked all night. His back was sore, but his hopes were high and he worked and saved his money.

Phil, as he was known by all his friends — and before he died he had them in all parts of the world — was born on a farm. The whole Armour family were farmers. The old family plow, dating back to pre-Revolutionary times, is still in possession of the family and can be seen at the Chicago Stockyards at this day.



4 FAMOUS LEADERS OF INDUSTRY

From the time he was born, in 1832, until he left the farm, Phil was the most active and energetic youngster in his home town. All who knew him admired his soundness of judgment and his desire to be continually accomplishing something. He could not be idle.

The rush for gold in California was at its high mark when Phil reached the age of nineteen. Farm life became irksome to the ambitious youth, and, like many others, he cast anxious glances toward the West — the unknown land — where stories of untold wealth were born and floated eastward on every breeze. Mother Armour, like all the rest of the family, was too sensible and loving to permit her boy to run away, so, with her blessing and several hundred dollars in cash, Phil with a few companions left the old homestead and started on foot for the land of the gold-paved streets.

It was quite an undertaking. One member of the party died, two decided it was too far and turned back. Phil and the remainder of the party, however, trudged on. At Independence, Kansas, they purchased a prairie schooner and the question of whether to purchase oxen or mules to draw it arose. Some members of the party wanted mules, because they thought they could travel faster. The party finally decided to purchase oxen, and the wisdom of this course became apparent in a few days, when the schooner began passing other schooners which had been compelled to stop to let the mules recover from attacks of sore feet.

The trip from Stockbridge, New York, took six months, and, as he was footsore and weary, Phil spent

a day or two in looking the situation over in California. After studying conditions carefully Phil showed his good judgment — which men admired him for in later years and which he frequently demonstrated in business enterprises — by deciding to build sluices instead of taking chances on becoming suddenly rich or being everlastingly poor searching for gold. Besides, he reasoned, building sluices required plain labor, it was true, without excitement, chance or glamor, but it would be the most dependable occupation in the long run for one would know just how much one was going to make at the end of a day's work. A five-dollar gold piece in the pocket, he thought, was better than fifty-dollars' worth of gold dust somewhere in the "diggins."

Phil was strong and a willing worker, so he built a great many sluices. In fact, he worked day and night. Instead of working with his hands all the time he used his head, too, and finally decided to take contracts to build sluices, thereby giving employment to many miners who were without funds and who wished to earn money to return home. Business was good, as there were many miners who wanted sluices built. Phil prospered.

After five years, during which time he worked hard and saved his money, young Armour had accumulated a few thousand dollars. This he knew would buy the best farm in Oneida County, New York, and, as that was as much as any young man in his day could desire, he started homeward with visions of marrying the girl he left behind. When he arrived he found she had

6 FAMOUS LEADERS OF INDUSTRY

married another. Somehow, when he learned of this, the several farms offered for sale did not appeal to him, so he started for other parts to stake his fortune.

It so happened that on his return from California young Phil had rested for two days in Milwaukee. It was then a prosperous, growing city — the gateway to the West. Youthful, bewhiskered Argonauts, some high with hope and others returning with plenty of California gold, halted there on their cross-continental journeys. Chicago, eighty-five miles to the south, was somewhat behind in the race for supremacy because of its low marshy land. Phil decided Milwaukee was the logical place to stake his small fortune in trade. Opportunity offered itself and he joined with Fred B. Miles, on March 1, 1859, in the produce and commission business. Each man put five hundred dollars into the undertaking. The enterprise prospered from the start. It handled the smoked and pickled meats then in great demand by travelers, in caravans going to and from the coast, because it was something that would keep. At this time the farmers salted and smoked hams and brought them to town with furs, pelts and bags of wheat.

The firm of Miles & Armour prospered during its three years of existence and P. D. Armour became well known in business circles. In 1863 John Plankinton, the largest packer in Milwaukee at that time, needed a partner in his business, and P. D. Armour succeeded Frederick Layton, the firm becoming Plankinton & Armour. Pork-packing was the chief business of the new firm. Both John Plankinton and P. D. Armour

were hard workers. They came to work at four o'clock in the morning, worked hard until late at night — and business boomed.

After the Civil War Chicago speedily passed Milwaukee in the contest for commercial success and Philip Armour prevailed upon his brother, H. O. Armour, to go to New York and open the house of Armour, Plankinton & Co., commission merchants. Joseph F. Armour took charge of the Chicago office, which as yet did no meat-packing. The Union Stockyards commenced operation in 1865 and in 1867 the Chicago house of the firm commenced packing hogs under the name of Armour & Company. The packing of hogs exclusively was the business of the new firm for eight years.

The open ranges of the West, feeding-places for the bison of Mr. Armour's boyhood days, were by this time, however, becoming the seat of extensive grazing operations for cattle. Huge ranches were beginning to spring up and cattle commenced coming to the markets. In 1878 Armour & Company began killing cattle, and in 1880 sheep were first slaughtered.

Armour & Company, under the direction of P. D. Armour, began developing new markets in all directions in order to care for their increased trade, which grew with the development of the country. In 1878 the refrigerator-car was perfected, and this important event systematized the marketing of fresh meat. Mr. Armour saw the importance of this and knew that the refrigerator-car was the "open sesame" to a business of tremendous proportions. He saw how it would link

the meat-producing sections of the great West to the more densely populated and heavy meat-consuming centers of the East.

Up to this time there had been no such thing as an adequate fresh beef supply in the East and such Western beef as got there went alive in stock-cars. Moving cattle from the prairies where production costs were low to the Eastern centers of consumption where grazing lands did not exist entailed transportation which was both poor and costly. The refrigerator-car, Mr. Armour saw, would offer a way to get beef from the West to the East even in summer time, and he started out to take advantage of this.

He encountered a snag, however, as the railroads did not take kindly to the suggestion that they build refrigerator-cars for the transportation of fresh meats. This did not deter Mr. Armour, for he built his own fleet of refrigerator-cars. Business expanded rapidly, due to the novel opportunity of eating fresh meat in what, in those days, was considered the "off season," and Armour & Company grew as new fields of endeavor opened up.

Philip Armour understood thoroughly the science of eliminating waste. This principle of turning everything into account was carried out persistently by him for forty years and was chiefly responsible for his success in later life much the same as he had obtained his financial nest-egg in California by saving while he was digging ditches. When he established the Chicago firm of Armour & Company he still was governed by the principles of industrial thrift, and, consequently, set

about to utilize waste material which previously had been thrown away. In other words, he started to develop a line of by-products from the various parts of the animals slaughtered, not sold as meat, and which to-day is of such tremendous economic importance to the world.

Instead of paying somebody to haul the waste away, as had been the custom, Philip Armour started the manufacture of glue, fertilizer and soap. Many other lines of by-products were added from time to time until to-day they are an important part of the packing industry. Without these by-products fresh meat under prevailing prices for the live animals would be out of reach of the average individual. Even before the by-product line was developed to the *n*th power of perfection it is to-day, Philip Armour used to say:

“Give me the waste from the animals slaughtered and I’ll make more money than the fellow selling the meat.”

From 1890 to 1900 the firm of Armour & Company continued to grow under the guidance of Mr. Armour. It expanded until it became international in scope.

P. D. Armour always was a worker — even to the day of his death he was actively engaged in his business. He was a human dynamo with unlimited power. He did not follow others, he led. Because of his indefatigable energy and because he had the faculty of choosing the right men for the right jobs he succeeded in building up a great international industrial enterprise which demonstrated its wonderful organization, efficiency and worth during the recent World War. He

10 FAMOUS LEADERS OF INDUSTRY

worked from early morning until late at night even after he had acquired a fortune. He was the first one down in the morning and the last to leave. He used to say that the man who got in first was the man who won. Quick judgment plus quick action was his formula for success. That he was quick to act and quick to judge is demonstrated by many interesting things told about him.

One of the most spectacular of his triumphs was his shattering of an attempted wheat corner in '93. At that time Mr. Armour was personally handling a grain business which he had created as a side line during his meat-packing activities. Because of the panic, cash grain in Minneapolis and other Northwestern grain centers was selling at such great discounts under the Chicago May future that a large profit could be made by buying up country grain and selling the Chicago May against it. Mr. Armour bought several million bushels in the Northwestern market.

At the same time a combination of rival grain operators bought up all cash grain in Chicago and refused to move it out. As the law decreed that all grain be kept in registered elevators, this move by the combine did not leave any elevator room in Chicago for Mr. Armour's Northwestern wheat. With sixteen hundred cars of wheat waiting on the tracks, three hundred boatloads on Lake Michigan and no elevator room, Mr. Armour discovered he was up against the crisis of his life.

True to his past performances, it didn't take him long to decide what to do.

“I’ll build an elevator and hold it,” he declared, amid protests from architects and advisers who said this would be impossible to accomplish inside of six months.

“Six months nothing!” Mr. Armour retorted vigorously.

It was noontime and he grabbed a telephone and called a contractor. By five o’clock that day the plans of a three-million-bushel elevator were drawn. By seven o’clock electric lights were installed and excavations begun. Despite the fact that labor was at a premium because of the Chicago World’s Fair the elevator was completed and receiving grain in just forty-two days. The combine was defeated.

Mr. Armour was quick to do things not only in business but in whatever he undertook to do. In the old Plymouth Church one Sunday morning, Rev. F. W. Gunsaulus was preaching a sermon on the subject “What I would do with a million dollars.” Mr. Armour was present and he listened intently as the clergyman unfolded his vision of affording technical education to boys who were too poor to attend regular technical colleges and described the kind of an institution he would build. After the sermon, Mr. Armour went up to Dr. Gunsaulus and said: “If you will give your time to such an institution as you have outlined, I will give you the money.”

Dr. Gunsaulus agreed and the school became a reality — a very important factor in the field of technical education.

It is estimated by close friends of Mr. Armour that he gave away \$5,000,000 in small unrecorded amounts.

12 FAMOUS LEADERS OF INDUSTRY

It was a habit of his to put one hundred dollars on his desk each morning and on his trips through the office and plant would reward zealous employees for good pieces of work or for some sign of good judgment. He seldom took home with him more than ten dollars at the end of the day's work. He also was in the habit of giving his employees suits of clothes and many a man was sartorially outfitted by Mr. Armour for some little thing he had accomplished in a creditable manner.

Mr. Armour knew human nature. He knew what people would do under average conditions. He knew what the rank and file of his own men were interested in.

An interesting sidelight on one of his donations to a worthy cause came to light not long ago, years after his death, when an Armour salesman entered a little country store. The storekeeper gave the salesman an order and never asked the price of a single article. Naturally, the salesman was surprised and he asked the reason for this action.

"Years ago when I was a young railroad engineer," the merchant explained, "my eyesight troubled me, and one night I missed a signal and ran my train into an open switch, just missing a bad wreck by the will of Providence. Well, Phil Armour was on that train and he came down the track to where I was standing. Taking the lantern from my hand he held it up to my face and I could see his eyes searching me to see if I was sober and trustworthy in appearance. Then, saying nothing, he turned and walked away. A few days later I received a letter from him advising me to give

up railroading and stating he was enclosing a check for \$1,000 for me to set up in some kind of business. That's why I never question the price of Armour products."

Mr. Armour often declared he was not making money just to have it, but to enable him to help others.

"You know it gives me more pleasure to give away this money than it does the other fellow to receive it," he often declared to his secretary when the latter suggested the advisability of investigating some of the applicants for charity. This is demonstrated by a study of his entire career, which showed him always planning, building, devising and creating. He did not hoard money, but invested it again so it would set more men to work. During his lifetime he had the distinction of employing more men than any other individual in the world.

When Mr. Armour died in 1901 he had a concern doing a business of \$180,000,000 a year. In 1918 the company did a business of \$861,000,000 and employed fifty-seven thousand three hundred and three men in their sixteen plants and four hundred and twenty-five branch houses throughout various parts of the country. The plant he established in Chicago in 1870 was run with a small thirty horse-power engine, which, incidentally, is on exhibition in the largest refrigeration plant in the world at Armour & Company's power house in the Chicago stockyards to-day. The company has five thousand four hundred and thirty-three refrigerator cars hauling the finished food products from the plants to the branch houses where it is distributed to

14 FAMOUS LEADERS OF INDUSTRY

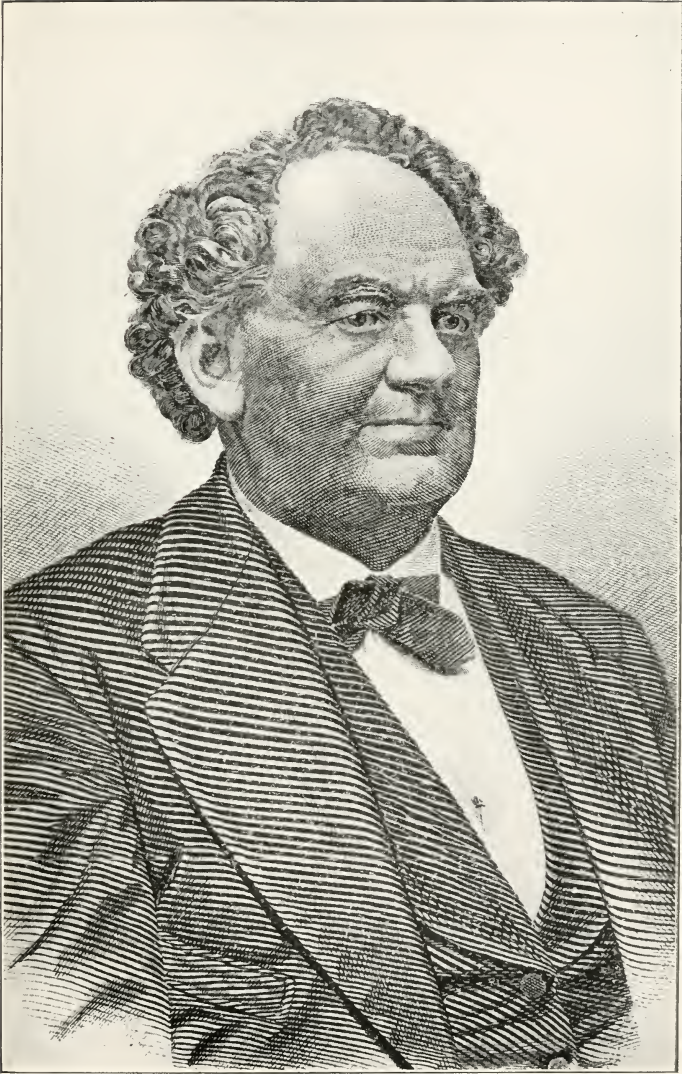
retailers who, in turn, distribute it to the consumers of the country.

Mr. Armour's death was the result of heart trouble from which he had been a sufferer for two years, a muscular affection of the heart, known as myocarditis, being the immediate cause. Even to his death he was the same energetic and enthusiastic worker as of old, refusing to remain idle despite the advice from his physician that he rest and take things easy. During the last two years of his life, while suffering from heart trouble caused originally by the bursting of a blood vessel, Mr. Armour was always in close touch with his business affairs. Whether in Europe or in California he had his stenographer with him and he dictated the general policy of the business by cable or telegraph.

To-day his picture hangs in the Hall of Fame at the State University of Illinois at Urbana. At the ceremonies which marked the unveiling, big men, both in the business and agricultural worlds, gathered and paid eloquent tribute to his achievements, which they declared would result in the name of Philip Danforth Armour being known for all time in the history of the nation's commercial development.

P. T. BARNUM

THE WORLD'S GREATEST SHOWMAN



PHINEAS TAYLOR BARNUM

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1900

P. T. BARNUM

THE WORLD'S GREATEST SHOWMAN

THIS versatile, enterprising genius, and one of the greatest celebrities that ever lived, was born in Bethel, Conn., on July 5, 1810. His name, Phineas Taylor, came from his maternal grandfather, a great wag, who at his christening gave his mother a gift-deed, in his behalf, to five acres of land, "Ivy Island"—of which more hereafter.

His father, Philo Barnum, son of Ephraim, a captain in the Revolutionary War, was a tailor, farmer, and sometime tavern-keeper.

The boy Phineas, like most farmers' boys, drove cows to and from the pasture, shelled corn, weeded the garden, and, when bigger, rode horses for plowing, turned and raked hay, finally handling the shovel and hoe.

Phineas was six when he started to go to school, and he proved an apt student. He was especially good at arithmetic, and was once called out of bed one night by his teacher who had laid a bet that the boy could calculate the correct number of feet in a load of wood in five minutes. He did the sum in less than two!

His business instinct early developed, and by the time he was six he had saved enough pennies to exchange for a silver dollar, the possession of which, Mr. Barnum once said, "made me feel far richer than I have ever since felt in the world."

18 FAMOUS LEADERS OF INDUSTRY

As Phineas grew older his capital increased, for he earned ten cents a day riding the horse that led the ox-team in plowing, and on holidays, instead of spending his money at fairs and exhibitions, he earned quite a lot by peddling molasses candy, gingerbread, cookies, and cherry rum. By the time he was twelve, besides other property, he owned a sheep and a calf, and would soon have been a small Rockefeller if his father, as he humorously relates, had not "kindly permitted me to purchase my own clothing."

About this time came a great event in his life. It was January, 1822, when Daniel Brown put up at his father's tavern with some fat cattle he was driving to New York, and mentioned during supper, in the boy's hearing, that he needed a boy to help him.

Phineas burned to see the metropolis, and besought his father and got his consent to go. So next morning at daylight in a heavy snowstorm he started on foot with the cattle. After spraining his ankle while chasing a stray ox, a misadventure he was afraid to tell about for fear of being sent back, he reached New York after four days.

On leaving home his mother had given him "one dollar," which she thought would satisfy his every need. But after buying some oranges at six cents apiece, a knife, some candy, a gun that would "go off" and some torpedoes he was about broke.

Getting back to the Bull's Head Tavern, where he and Farmer Brown had put up, his first prank was to hit the barkeeper with an arrow from his "gun," for which he got a sound box on the ears; then he exploded

some of his torpedoes in the dining-room, the guests flying in terror in every direction. Whereupon the landlord floored him with a blow, exclaiming:

“There, you little greenhorn — that’ll teach you better than to explode your infernal firecrackers in my house again!”

Meanwhile Phineas had eaten his candy, and thought it the finest thing he’d ever tasted. So back to the toy-shop he went, and, to make a long story short, he finally exchanged all his purchases, including some of his clothes, for candy, devouring it as fast as he got it.

On his return home, after the cattle had been sold, he was soundly whipped. So ended ingloriously his first visit to New York.

It was now decided to let him visit his wonderful estate “Ivy Island,” about which he was always hearing. He had heard himself called the “richest child in town,” the fear expressed that he would be “stuck up” after inheriting so rich a property, and even his father and mother hoped he would “do something for the family” when he reached his majority and came into his estate. And his grandfather took care to remind him that he was indebted to him for his wealth because he had been named Phineas after him. As he started on his expedition, tremendously hopeful and eager, with beating heart, his mother said:

“Now, Taylor, don’t become so excited when you see your property as to let your joy make you sick, for remember, rich as you are, that it will be eleven years before you can come into possession of your fortune.”

20 FAMOUS LEADERS OF INDUSTRY

The hired man, Edmund, ax on shoulder, went along as guide. Crossing a meadow, they reached some swamp-lands.

“We were obliged,” as Mr. Barnum relates, “to leap from bog to bog. . . . I was up to my middle in water and a swarm of hornets attacked me . . . after floundering through the morass I arrived half-drowned, hornet-stung, mud-covered, on dry land, and then reached the margin of a stream. I now discovered the use of Edmund’s ax, for he felled a small oak to make a bridge. Crossing, I proceeded to the center of my domain. I saw nothing but a few stunted ivies and straggling trees.

“The truth flashed upon me. I had been the laughing-stock of the family and neighborhood for years. . . . Just then a huge black snake (one of my tenants) approached me with upraised head. I gave one shriek and rushed for the bridge. This was my first and last visit to ‘Ivy Island’!”

As Phineas grew older his dislike for farm and other manual labor increased. This was set down to laziness, and, despairing of him, his father resolved to make a merchant out of him. So he erected a building in Bethel, and, with Hiram Weed as partner, started a general store, installing Phineas as clerk on a small salary out of which the boy had to clothe himself.

He soon developed into a shrewd, sharp trader, getting a world of experience and knowledge of human nature as a result of his dealings with many diverse characters.

Young Phineas was well brought up, so was a con-

stant church and Bible-class attendant. In those days churches were not heated, and in severe winters it was no small hardship to sit several hours in a freezing meeting-house. It would have been considered impious — sacrilegious — to put a stove in one. The youth nevertheless liked church-going and especially the Bible class, in which he soon distinguished himself through his excellent knowledge and comprehension of the Scriptures.

In 1825, when the boy was only fifteen, his father died at the age of forty-eight, leaving his mother with five children and an insolvent estate. So straitened was the family that Phineas had to get trusted for the pair of boots he wore to his father's funeral. His mother later on, however, by hard work and great economy, succeeded in redeeming the homestead.

Meanwhile Phineas got a position at \$6.00 a month and board, and, gaining the confidence of his employers, who gave him opportunities of doing so, he soon began to make money on his own account, for he was a born trader and fond of anything speculative.

The next fall found him in Brooklyn, clerking for Oliver Taylor, formerly of Danbury, where in time he was entrusted with all the buying, scouring New York City in search of bargains. But he was not satisfied with a mere salary. He had a speculative genius and was not content if he could not increase his earnings by energy, perseverance, diligence in business, tact and "calculation."

In the summer of 1827 he caught smallpox and afterwards went home to recuperate. Returning to Brook-

lyn, he gave Mr. Taylor notice, and opened a porter-house (saloon) on his own account. But he was not in business for himself long, for, getting a good offer, he sold out at a handsome profit, and then became a clerk in a similar concern kept by David Thorp, 29 Peck Slip, New York. He lived with the family, was kindly treated, and developed a strong taste for the drama. Though he sold liquors to others, he didn't indulge himself. Furthermore he daily read his Bible and attended church regularly. His habits were good in early youth.

Returning home to Bethel in 1828 he opened a retail fruit and confectionery store in a part of his grandfather's carriage house which had been offered him rent free if he came home.

This was, Mr. Barnum once said, "an eventful era in my life. My total capital was \$125, fifty of which I had spent in fitting up the store, seventy in stock in trade. . . . The novelty of my little shop attracted attention. I was obliged to call in one of my old school-mates to assist. When I closed at night I had the satisfaction of reckoning up \$63 as my day's receipts, yet my stock was not seriously diminished, showing that my profits had been large."

Later, on the advice of his grandfather, he sold lottery tickets on a commission of ten per cent., and this business, together with his store, netted him a most satisfactory profit.

During this season the young trader extended his lottery business, opening agencies throughout Connecticut.

In 1829, he married Charity Hallett, of Bethel, a

young tailoress he had greatly admired for several years.

During a period of great political excitement, some articles he had written were rejected by a Connecticut paper he had offered them to, so he at once bought a press and types and on October 19, 1831, issued in Danbury the first number of his own paper, *The Herald of Freedom*.

The boldness and originality of its editing gave it a large circulation, but its young owner and editor lacked experience in journalism, and before long, in one of several libel suits brought against him, he was convicted, fined, and jailed for sixty days.

Feeling ran high and he had everybody's sympathy. So he was made very comfortable while in jail. A room was papered and carpeted for him, he lived well, and was kept busy receiving an endless stream of visiting friends. He issued his paper, as usual, and it prospered more than ever. The day he was released he received a great ovation, going home in a coach and six with a band, and there were processions, speeches, odes, and salvos of cannon. Upon arrival in Bethel amid general rejoicings, the band struck up "Home, Sweet Home."

In 1836 Barnum sold his paper, and drifted to New York, where he tried in vain to enter mercantile life on a partnership basis. His money running low he at last started a boarding-house at No. 52 Frankfort Street.

In spite of all his cares, anxieties and struggles his jocose moods predominated. He loved fun, practical

fun, for itself and for the enjoyment it brought. He was quick-witted and invariably able to turn the tables on inveterate jokers, especially the kind that picked up money by laying "catch" bets.

About now the fortunes of Mr. Barnum and his young wife were anything but bright, and it was clear to his mind that he had not yet found his proper vocation. He had not yet discovered that he was to cater to an insatiate human want — the love of amusement; that fame and fortune awaited him on two continents as soon as he should appear before the public in the character of showman.

It was not until 1835, however, that Phineas T. Barnum found his true vocation, beginning in this year his long, vicissitudinous career as showman.

His first acquisition was "one of the greatest curiosities ever witnessed, viz.: JOICE HETH, a negress, aged 161 years, who formerly belonged to the father of General Washington." It was also claimed, by the man who was then exhibiting her in Philadelphia and from whom Barnum bought her, that she had been George Washington's nurse.

At the outset of his new career as showman, he realized that everything depended upon getting people to think, talk, become curious and excited about the "remarkable curiosity." So posters, transparencies, advertisements, newspaper paragraphs were used regardless of expense, and in all the cities in which he exhibited Joice Heth his rooms were crowded. She died the following year.

By now Mr. Barnum was sure of his ground — sure

that he had at last found his destined occupation in life, and his next exhibit was the "eminent Italian artist," Signor Vivalla, as he re-christened him, an acrobat whom he engaged for one year at \$12 a week. He cleared about \$150 a week on him in several cities, but in Washington went broke and had to pawn his watch to get back to Philadelphia. While at the Capital he saw such famous statesmen as Clay, Calhoun, John Quincy Adams, Polk, etc.

Dull times in Philadelphia and small audiences had the effect of stimulating Mr. Barnum's wits and developing in him the art or instinct of exciting the public's curiosity, which he realized more than ever was essential to success in his business. So, as he had just discovered a circus-performer — a balancer and juggler — named Roberts, the idea came to him of concocting a challenge — with the stakes at \$1,000 — from Roberts to Vivalla. It was of course accepted, and the great "trial of skill" was extensively advertised, arousing the public to fever heat. Needless to say the house was jammed on the first night, and the "contests" were continued indefinitely at much profit to Barnum.

Traveling about the country the young showman had endless adventures. Once he was chased through a town, caught, and nearly lynched. It turned out that his partner had pointed Barnum out, as he was leaving the hotel, as the "Rev. E. K. Avery, the murderer of Miss Cornell." This started a mob after him, all his assertions that he was *not* Avery were useless, and at last he was marched back to the hotel like a malefactor, his clothes in rags, a vast crowd following. Here, of

course, his partner, exploding with laughter, identified him and he was released.

On Barnum bitterly upbraiding him for his trick, he replied:

“My dear Barnum, it was all for our good. Remember, all we need to insure success is notoriety.”

And so it fell out. The pair had crowded houses, for everybody was curious to see the two showmen who played such extensive practical jokes on each other.

It was a nomadic, adventurous life that Barnum led at this period of his extraordinary career, visiting, with his traveling show, remote points, and undergoing all sorts of hardships and dangers. One day he was “broke,” the next flush. It was at best a hand-to-mouth existence, and he was still at the foot of the ladder when, through clever diplomacy on his part, based on almost uncanny shrewdness, he managed to get possession of the American Museum, on Broadway, New York.

From the moment Barnum became proprietor and manager of the American Museum there began a new epoch in his career, which thereafter was one of brilliant success, accompanied by occasional setbacks. It was, he once said, “the ladder by which I rose to fortune,” for he made it the most popular place of amusement in the world. The public’s curiosity as to giants, dwarfs, mermaids, Indians, elephants, etc., was insatiable, and so much money rolled in as to embarrass him.

In 1842 Barnum discovered at Bridgeport, Conn., the remarkably small child, not two feet high, which he later exhibited with tremendous success throughout the

world as "General Tom Thumb." This was one of his biggest catches in the curiosity line. The midget's visit to the English Queen at Buckingham Palace caused the royal family much amusement.

"Good evening, ladies and gentlemen!" the "General" exclaimed as he entered the royal presence. A burst of laughter followed the salutation, and the Queen took him by the hand, led him about the galleries, asking many questions. Finally the General familiarly told the Queen her picture gallery was "first-rate," and added that he'd "like to see the Prince of Wales."

On a second visit, the Queen, after inquiring as to his health, and receiving the reply that he was "first-rate," said: "General, this is the Prince of Wales."

"How are you, Prince?" said the General, with great cordiality, shaking hands heartily. Then standing beside the Prince he remarked: "The Prince is taller than I am, but I feel as big as anybody!" upon which he strutted up and down as proud as a peacock, amid roars of laughter.

As a result of Royal patronage Tom Thumb was all the rage in England, and the little fellow's wages were raised from \$3 a week to \$25, then to \$50, when Barnum made a new arrangement with the "General's" father by which they became equal partners.

When Tom Thumb visited the Queen Dowager Adelaide he wore a gorgeous court costume.

"Why, General," said the Queen Dowager, "I think you look very smart to-day."

"I guess I do," piped the General complacently.

The Queen, laughing, took him upon her lap — his

dignity suffering no damage seemingly — and presented him with a beautiful gold watch.

In France the General traveled in a diminutive coach and four, receiving royal honors.

Mr. Barnum next achieved a tremendous triumph in the rôle of impresario, introducing to the American public the noted Swedish songstress, Jenny Lind. To bring this about he had to deposit with the vocalist's bankers the prodigious sum (for those days) of \$187,500. It took some hustling to raise this amount of cash in the required time, and he was \$5,000 short, when his old Philadelphia friend, the Rev. Abel C. Thomas, to his inexpressible joy and thankfulness, placed that amount in his hands.

The Swedish nightingale arrived in New York, September 1, 1850, on the paddle-wheel steamship *Atlantic*, and received a wildly enthusiastic reception. There were decorations, bands, receptions, and at midnight of that day the singer was serenaded by two hundred musicians who were escorted to her hotel, the Irving House, by three hundred firemen with flaming torches. The excitement lasted for weeks, her concert tour proving an astounding success.

To Mr. Barnum's credit, be it said, when he saw that Jenny Lind's engagement was going to be successful beyond their expectations, he voluntarily made a change in the contract so greatly to her advantage that her own receipts were doubled.

Miss Lind was greatly astonished, and grasping his hand, said:

“ Mr. Barnum, you are a gentleman of honor. . . .

I will sing for you as long as you please; I will sing for you in America — in Europe — anywhere!”

And one of the first things she did was to devote the whole proceeds of one concert — \$10,000 — to charity.

Single tickets to hear her sold at auction as high as \$625!

The campaign closed in a blaze of glory, Jenny Lind receiving for ninety-five concerts some \$176,675, and Barnum's gross receipts after paying the singer were \$535,486.

In 1851 Mr. Barnum became part owner of the steamship *North America*, afterwards partly owned by Commodore Cornelius Vanderbilt, upon whom Barnum called one day.

“Is it possible you are Barnum!” exclaimed the Commodore, in surprise. “Why, I expected to see a monster, part lion, part elephant, and a mixture of rhinoceros and tiger!”

In 1855 the redoubtable showman was dashed to ruin in the crash of the Jerome Clock Company to which he had, in good faith, loaned very large sums.

He met his reverses with fortitude and calm confidence. Although fairly deluged with sympathy and bona-fide offers of help, even the little General offering to appear in a benefit, he declined all offers, and at the age of forty-six found himself once more at the bottom of the ladder. Living frugally in hired rooms on Eighth Street in New York, he fought as best he could a hounding and persecution set afoot by creditors.

About this time a new and novel friend came to Mr. Barnum's assistance — a huge black whale that came

ashore close to the farm on Long Island where he was spending the summer.

Mr. Barnum promptly bought the monster for a few dollars, and sent it to the Museum (which he had sold before his failure, intending to retire), where it was exhibited in a refrigerator, netting him enough, as his share of the profits, to pay his board bill for his whole family for the entire season.

Then, accepting a loan of \$5,000 from Mr. Wheeler, the sewing-machine man, with General Tom Thumb and others he set sail for England, returning in 1857 to New York, after a successful tour.

Now came some bad luck, for he lost by fire his magnificent residence, Iranistan, at Bridgeport, the only example of oriental architecture in the country.

After another visit to England where he lectured with great success on "The Art of Money-Getting," Mr. Barnum returned in 1859 to the United States.

Some of Mr. Barnum's "art of money-getting" maxims are:

True economy consists in always making the income exceed the outgo.

The foundation of success in life is good health.

Don't mistake your vocation.

Persevere.

Whatever you do, do it with all your might.

Use the best tools.

Don't get above your business.

There is no royal road to wealth.

Learn something useful.

Be systematic.

Read the newspapers.

Beware of "outside operations."

Be charitable.

Keep your business affairs to yourself.

Preserve your integrity.

When this lecture idea was suggested to Mr. Barnum by some of his American friends in London, he told them that considering his clock complications he thought he was more competent to speak on "The Art of Money Losing"; but they encouraged him by reminding him that he could not have lost money if he had not previously possessed the faculty of making it.

Soon after returning home, in fact by March, 1860, Barnum was "on his feet again" and once more the owner of The American Museum, which soon began to teem with newer and more interesting curiosities than ever, including live white whales.

To keep these whales in their native briny, he tapped New York Bay bringing salt water into his museum basement and tank by pumping. The whales were caught alive in traps by various expeditions that Mr. Barnum sent out, and he soon added to his list of attractions an aquarium, the first in the country, also bringing the first "hippo" to America.

Mr. Barnum next ran across two more dwarfs, Commodore Nutt and Miss Lavinia Warren, the latter of whom later on married General Tom Thumb.

Mr. Barnum was a Jackson Democrat until secession threatened, when he allied himself to the Republicans, by which party, in 1865, he was nominated for the Connecticut legislature and elected.

In July of that year he sustained a heavy loss by the burning of his Museum. By November, however, he opened "Barnum's New American Museum" higher up Broadway, at Nos. 535, 537, and 539, with a fresh stock of curiosities from all parts of the world.

In 1866 Mr. Barnum was again elected to the legislature, and in 1867 was nominated for Congress, but defeated.

Mr. Barnum had had a twenty-five year lease on his old Museum property, and now succeeded in selling it for \$200,000 to James Gordon Bennett, founder and editor of the *New York Herald*, whose paper thereafter for many years was published on the site of the old Museum, Broadway and Ann Street.

He then made a successful lecture tour of the country, on one occasion riding on the locomotive of a freight train, for he believed in keeping engagements.

In 1868 the New Museum, with a priceless zoological collection, was utterly destroyed by fire with a loss of a million dollars, and for awhile Mr. Barnum retired from business.

But the energies peculiar to his nature couldn't be chained down, and, after a pleasure trip round the country including the Yosemite, in 1870 he organized his world-famed circus, a show still in existence though merged with others. He so augmented the show, after a brilliant initial success, that the expense of moving it about the country rose to \$5,000 a day!

In December his great circus caught fire and everything was destroyed except two elephants and one camel — a loss amounting to some \$300,000.

Nothing daunted, Mr. Barnum, with his usual fortitude, irrepressible energy and indomitable courage at once cabled his European agents to "buy another million dollars' worth of animals!" By April, 1873, he had brought together still another "colossal aggregation."

Upon his return to America, after ransacking Europe and spending large sums for additional rare animals, the citizens of Bridgeport gave Mr. Barnum a public dinner "as a mark of our esteem and of your liberality and energy in private enterprise and in promoting the industries and improvements of our city." In 1875 he was elected Mayor of Bridgeport.

About this time Mr. Barnum entertained King Kalakau, of the Sandwich (Hawaiian) Islands, at his circus, now grown so large that when he decided to "show" in Boston for three weeks, the cost of removal and of the immense canvas tents was \$50,000!

In 1878 he was elected for the fourth time to the General Assembly of Connecticut.

By 1880 Mr. Barnum had added to his show many notable features, including Admiral Dot, Woolly Horse, the What Is It, the firing of Zazel from a cannon, the tattooed Greek, etc.

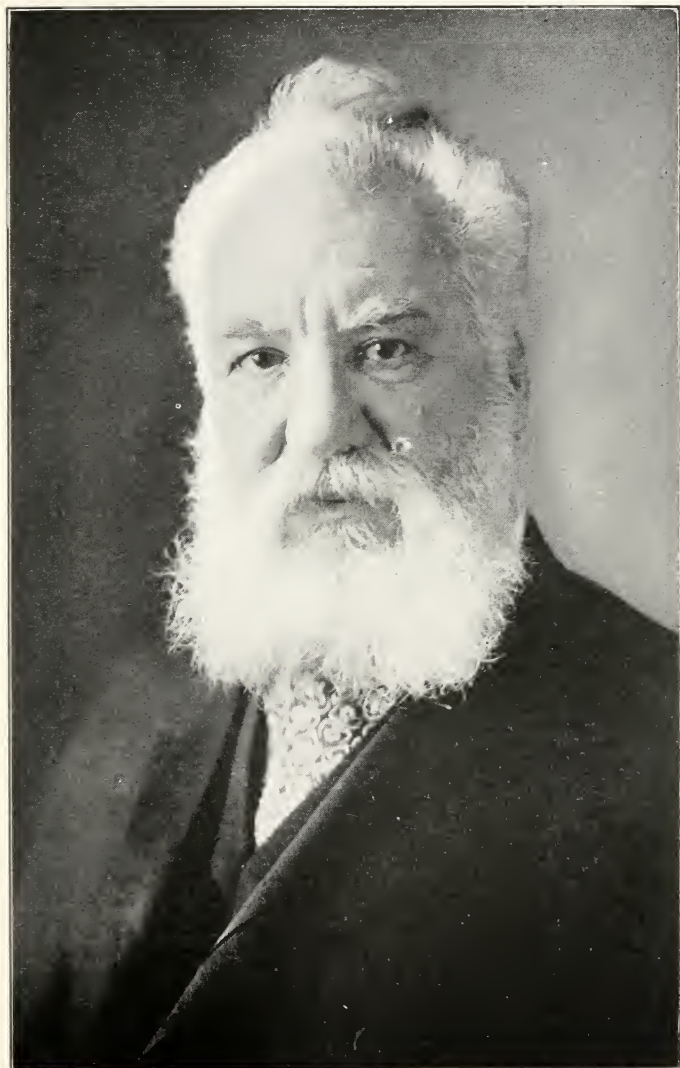
In 1882 he combined his circus with Bailey's and bought for \$10,000 the monster elephant Jumbo from the Royal Zoölogical Gardens, London. After arrival in New York with his prize his receipts for three weeks totaled \$30,000! Such was the sensational interest the arrival in America of this huge beast of the jungle aroused! Then he entertained the public with still an-

other curiosity — The Sacred White Elephant of Siam.

Marvelous was the career of Phineas T. Barnum as showman, and great was his celebrity. President Ulysses S. Grant once told him that his name was better known throughout the world than his — that everywhere he traveled he was asked “How is Barnum?”

Before he died he presented his native town with a magnificent bronze fountain, and, in fact, was always very liberal and public-spirited. He was a most entertaining writer, and, among many other things, wrote a book for boys called “Lion Jack,” another on “The Humbugs of the World,” and his famous autobiography, of which there have been sold millions of copies.

ALEXANDER GRAHAM BELL
IMMORTAL TELEPHONE INVENTOR, AND
HUMANITARIAN



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ALEXANDER GRAHAM BELL

IMMORTAL TELEPHONE INVENTOR, AND HUMANITARIAN

“**R**IG-A-JIG, and away we go,” was one of the very first messages sent over the telephone. Dr. Bell (in 1877) was lecturing upon and exhibiting his just invented telephone and naturally expected the distinguished Boston lawyer he had invited to speak into his apparatus to utter, perhaps, some immortal phrase, but the above absurd line was all the legal gentleman could think of on the spur of the moment.

Alexander Graham Bell, now deceased, was a son of Alexander Melville Bell, a noted Scotch-American educator and inventor. Born at Edinburgh, Scotland, on March 3, 1847, Alexander attended the Royal High School, and, as a boy, displayed inventive ability by designing a rotating contrivance for husking wheat. The idea came to him while doing some work for a miller who had commandeered his services. The boy, it is related, was playing around a grist mill, not far from home, when the miller spied him. Canny Scot as he was, he hated to see “idle hands,” so he roughly ordered the boy to get to work removing husks from wheat. The boy, somewhat amusedly, started in, but, like the boy McCormick, in Virginia, soon rebelled against such a slow, toilsome job. He decided he could

could do the work better with a nail-brush, and he did indeed get better results. At last he conceived the idea of husking wheat by machinery, and this idea, too, proved successful.

He was a precocious boy, educated above his years, and with an original, inventive turn of mind, which bent its ceaseless activities in every direction. Forming his boy playmates into a society for the "Promotion of Fine Arts Among Boys," with himself as professor of Anatomy, he would lecture his boy-classes in his father's attic, using small animal skeletons his father helped him to secure. One lucky day he found a dead suckling pig, and tremendous was the excitement of the Society, when the boy professor announced his lecture. There was, needless to say, a full attendance.

The youthful professor soon got warmed up over his porky subject, but when the time came to illustrate his argument by dissection, on sticking his knife into the *corpus*, imagine the horror and terror of the boy-professor and his class, when the pig emitted several ghostly grunts, as the gas and air escaped. All, including the learned lecturer, fled in consternation.

After leaving the High School, Alexander entered Edinburgh University, also receiving special training in his distinguished father's system for curing impediments of speech. Had it not been for the priceless knowledge of the human voice, of sound and of vibration, thus imparted to him by his father — what a different career might have been Alexander Graham Bell's!

In 1867 he entered the University of London, and then in 1870 his father, alarmed at the death of two of his sons from consumption, took Alexander to Ontario, Canada, where the family settled.

Two years later Alexander crossed the border and settled in the United States, where he introduced with great success his father's system of deaf-mute instruction, becoming professor of vocal physiology in Boston University. While devoting himself here to the science of speech, young Bell became interested in multiple telegraphy and it was while experimenting with a multiple-telegraph apparatus that the germ of the telephone invention was implanted in his mind, for he discovered that telegraph wires would transmit sound! He later on consulted a leading electrical authority at Washington, telling him his idea, and also that he hadn't sufficient electrical knowledge to perfect it. "Get it!" was the learned man's only reply.

Young Bell, luckily, knew all about sound and vibrations, and this of course gave him a tremendous advantage in working out his wonderful idea. He at once started to find out by experiment all he could about electricity, and while hunting a mechanician to make his instruments, he ran across, in 1874, Thomas A. Watson, destined to become his most valued associate. Bell confided to young Watson his great idea, and, "My nervous system never got a worse shock!" said Mr. Watson in later years.

The two young men were soon devoting practically their whole time to the "idea," Bell furnishing the plans, specifications, etc., and Watson the apparatus.

40 FAMOUS LEADERS OF INDUSTRY

On June 2, 1875, when Bell in one room and Watson in another, were hard at work on the apparatus, a strange sound suddenly came forth, and in that momentous instant Bell divined that his idea of sending sound over wires was possible.

Thus was born the telephone!

In a flash Bell turned to Watson and asked him to construct with all possible haste a sound-conveying apparatus according to new specifications, and the resulting crude apparatus, which took ten months to construct, was the first speaking telephone.

Forty years later Bell and Watson used this same apparatus — the first 'phone ever made — in their world-startling long-distance talk between New York and San Francisco — nearly 4,000 miles!

It was on February 14, 1876, that “the most valuable single patent ever issued in any country,”

———— U. S. Patent No. 174465 ————

was issued by the U. S. Patent Office to Dr. Alexander Graham Bell, then aged twenty-nine.

Strange to relate, on the same day that Bell filed his caveat upon the telephone, Elisha Gray, then in Chicago, filed one also, but a few hours later! Which only illustrates the truth of the saying: “Great minds run in similar channels.” Bell's application was filed first, and Bell got the patent, Gray perhaps losing a big fortune and immortality by only a few minutes!

Bell, however, very nearly lost his English patent rights. A bit of luck due to a singular accident alone

saved him. It seems that Lord Kelvin, formerly Sir William Thomson, the famous English physicist, after one of his American tours, took one of Bell's crude instruments back to England with him, intending to exhibit it as a remarkable Yankee contrivance. But on the voyage home, a certain spring on the Bell transmitter was bent. So, when the day and hour of the exhibition arrived the Bell telephone wouldn't work, and it never occurred to the distinguished scientist to press the spring down again. As he couldn't make it work, no matter how he puzzled over the apparatus, his audience had to be dismissed with an apology. Had it worked, it would, under English law, have constituted "publication before application for patent" and this would have lost to Bell all his chances of getting his telephone patented in England. This trivial accident to the apparatus saved Bell. But for a big wave that sent a ship over on her beam-ends and baggage flying in every direction, the English would have had mighty cheap telephones!

But to return to America and Dr. Bell. Getting a patent is one thing but marketing the patent is another. Nobody believed in the telephone. "Oh, it's only a toy!" many would say. Hence it proved well-nigh impossible (for a long time to come) to get any one to put money into a telephone business. Only a long and arduous campaign of educating the public, by public tests and lectures, at last removed prejudice and enabled the great telephone inventor to carry out his plans.

Bell's first exhibition of his newly-patented telephone

was at the Centennial Exhibition in Philadelphia in 1876, soon after his patent was granted. It was a curious-looking object, or apparatus, he produced before his large audience. An old cigar-box, two hundred feet of wire, two magnets from a toy fishpond — and this was all the first Bell telephone consisted of. But Lord Kelvin, who was at the Exhibition, spoke of it as “perhaps the greatest marvel hitherto achieved by the electric telegraph.”

Quite amusing to us to-day is the account of the first long-distance test. This was between Boston and New York, Professor Bell going to New York, to take charge of the test at that end, he having obtained permission to use the wires of the Atlantic and Pacific Telegraph Company for the purpose. One of Dr. Bell's three associates in his telephone business was the mechanic, Thomas A. Watson, then a youth of twenty. He had charge of the test at the laboratory end, in Boston.

“That recollection,” said Mr. Watson a few years ago, “is extremely vivid in my mind because it took place in very hot weather. Our laboratory was in the upper floor of a boarding house, not an expensive boarding house either, I can assure you. The house was full of boarders, and as we had disturbed them quite seriously by shouting and talking and all sorts of noisy experiments, we were, for that and other good and sufficient reasons, not on good terms with the landlady.

“So I realized that as I had to do the shouting of my life that night, I must muffle the noise. So I took the blankets off my bed and Dr. Bell's and arranged a sort of tent over my big telephone with five thicknesses

of blanket. When I got the signal from Dr. Bell in New York, that he was ready to hear from me, I crawled in under my blanket tent and for two mortal hours I shouted to him. I needed no Turkish bath that night!

“The next morning I asked the landlady rather timidly if I had disturbed the boarders during the night. They hadn’t heard a sound! So, like many others, the experiment was a success.”

One of Dr. Bell’s first lectures in New York City was illustrated from New Brunswick on the Pennsylvania Railroad. A negro with a fine baritone voice had been engaged to do the singing and young Watson went there with his instruments, cornet, organ, etc., to superintend the demonstration. In spite of all Watson’s urging, the negro was afraid to get close enough to the transmitter for his voice to be heard in New York. After his song Dr. Bell told Watson, through the ’phone, that the audience hadn’t heard a word of it. “You sing, Watson,” he finally said.

Now the young lady operator — one of the first “hello!” girls — had invited a crowd of girl friends to the test. Imagine young Watson’s confusion — only twenty years old and the most bashful boy you ever saw! But there was no getting out of it, relates Mr. Watson, “I had to sing. Those girls looked solemn, and I didn’t blame them; but I sang my whole repertoire and I could hear them applauding in New York.”

The young Professor and his three associates — Hubbard, Sanders and the boy Watson — were in ter-

rible need of money, about this time, and had just been grievously disappointed by the Western Union Telegraph company, who (fortunately for Dr. Bell) refused to give \$100,000 for the Bell telephone patent. Nevertheless, the lectures or illustrations given during this year, 1877, by Dr. Bell were the foundation of the telephone's success. They aroused the intensest interest, and great crowds attended them first in Boston, then in Salem, and later in Providence, where no less than 2,000 people crowded the hall. The youthful Watson, the first telephone engineer, was always at the "other end," and would talk and sing hymns over the 'phone, once using a small brass band to play into the receiver.

Dr. Bell, at this time very poor, saw a chance to make an income out of these lectures, for he was getting requests in every mail from other cities, so he employed a special agent to look after this part of the business and also do some lecturing. He and Dr. Bell lectured at the same hour, but in different cities, young Watson (in between) furnishing the music, talk, etc., to both lecturers simultaneously. These lectures attracted capital to the telephone business, then under Bell's direction, and within a year Professor Bell succeeded in making his telephone commercially practicable. Until then it was ridiculed as a toy.

The resulting financial gains facilitated the Professor's marriage to Mabel, the daughter of Gardiner Hubbard, one of his most loyal associates. Miss Hubbard had lost her hearing in infancy, and had been for some time one of Dr. Bell's patients, deriving much benefit

from his knowledge and scientific treatment of her ailment. On the day of the marriage, Dr. Bell's gift to his bride was his stock in the Bell Telephone Company — a gift to become later one of immense value — a value far up in the millions. After the ceremony Dr. Bell and his bride took a trip to England, leaving the telephone business in charge of his associates.

At this period the great pioneers of the telephone were, in addition to Dr. Bell, its inventor, the youth Thomas A. Watson, who constructed it, Thomas Sanders, who put up the money to finance it, and Dr. Bell's father-in-law, Gardiner Hubbard, the practical man of business who introduced it. The legal end of the telephone business was attended to by the lawyers James Storrow and Chauncey Smith. Later on, Theodore N. Vail welded the straggling telephone system into a world-wide and immensely profitable commercial enterprise which in less than forty years had returned to its shareholders more than \$2,000 for each \$1.00 originally invested.

So it was that Dr. Bell's long and laborious experiments, conducted at a time in his life when he was extremely poor, were crowned with success, and he lived to see the wonderful idea his brain had conceived evolve into a billion-dollar enterprise.

Fame and riches were his!

In 1880 the French Government awarded Bell the Volta prize of \$10,000, and in 1882 added to it the Cross of the Legion of Honor. Dr. Bell devoted the whole of the Volta prize to founding the Volta Bureau, for the "increase and diffusion of knowledge relating

to the deaf," at Washington, D. C., in which city for many years he made his home.

Another of Dr. Bell's wonderful inventions, foreshadowing the wireless, was his "photophone," with which one could talk along a vibratory beam of light instead of a wire. This was never brought to practical use.

Dr. Bell was one of the first of our great scientists and inventors to give an impulse to aviation. He was carrying on experiments, with what he called his "tetrahedral kites," and needed a very light motor to put in them. Glenn Curtiss was then at Hammondsport, N. Y., making motorcycles, and Bell employed him to make his motors, incidentally, while he was with him, giving him his idea for the airship now bearing his name.

Bell's services to the deaf, whom he rescued from isolation by developing lip-reading into a science, were incalculable. In this connection it was his belief that defective hearing could be bred out of the human race. He also did much to develop his father's method of phonetic notation—"visible speech."

At his summer home, Baddeck, Nova Scotia, he also carried on some valuable experiments with sheep, tending to show how the production of mutton and wool could be increased and the price lowered.

For a long time, too, Dr. Bell conducted experiments and compiled some remarkable tables with the idea of promoting longevity through sensible living and eugenics.

He was also the co-inventor, with C. A. Bell and S. Taintor, of the Graphophone, an instrument for repro-

ducing sounds — human speech, songs, music, etc., and some other inventions of Dr. Bell's were the induction balance and the telephone probe, the latter for painlessly locating bullets or other substances in human bodies.

But all these pale into insignificance in comparison with his mastery of telephony. For who can estimate the benefits to humanity conferred by the now omnipresent telephone!

High in the Pantheon of the Great shines the name of Alexander Graham Bell, inventor of the telephone.

JOHN M. BROWNING
THE GUN WIZARD AND INVENTOR OF
THE MACHINE-GUN



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THE GUN WIZARD AND INVENTOR OF THE MACHINE-GUN

IT was in the early '40's, about the time of the great California "gold rush," that Johnathan Browning, a gunsmith, left his home in Tennessee for Council Bluffs, then a small Iowan trading post on the Missouri River. Here, for some time, he followed his vocation as a maker and mender of guns, as well as mending plows, kettles and other camp utensils for the settlers.

In 1852, however, piling his tools, his stock-in-trade and household goods into a prairie schooner — as the wagons of the plains were called at that time — he set out for the newly organized Territory of Utah. It took his oxen a whole month to reach Ogden, in the Mormon country, and here he located and soon had a thriving business as gunsmith and general tinker, for wild and unsettled were the times, and pioneers were coming and going all the time.

It was in this, then small Far Western settlement that his son, John M. Browning, destined to become the world's most famous gun inventor, was born in 1854.

"Jack" Browning, not very long after learning to walk, decided that his father's gunshop was the most fascinating place to play in he could find. He never grew tired of puttering around the junk heap, or

watching his father at the forge tinker up a teapot, mend a plow, gun or clock. It was all great fun for the boy, and, all unconsciously, he was learning something.

And so he grew up, mostly in the gunshop, his technical school, little dreaming that his tinkering with the junk pile would some day roll wealth into his pocket at the rate of \$3,000 a day, and hitch his name to the deadliest gun ever made, an invention of his own.

"Jack's" father sold guns as well as mended them. He turned out a very good article, and supplied the settlers, near and far, with firearms of his own manufacture. They were needed in those days, not only as protection against animals but against Indians, many of whom were hostile.

You may be sure that Jack knew how these guns were made. He had keen powers of observation and a good memory; and he had watched his father making them an uncounted number of times.

One day, when he was about fourteen, he said to his father:

"I'd like a gun."

"Well," his father replied, hesitatingly, "I might loan you one of these, here, if you'll be keerful."

"But I want one for my very own!"

His father shook his head:

"Can't afford it!"

"I'll make one myself then, and it won't cost anything!" was the boy's impetuous retort.

"All right! All right!" laughed his father. "Go ahead — but don't you go a-shootin' any gun of your

own contrivance until I try it first — it's as like to shoot both ends and in the middle — all at once!"

Jack beamed with joy, and sprang for the scrap-heap, the place where his father threw bits of iron, gun parts and other worthless material. He soon found what he wanted, put it on the lathe, and, before long, had a gun-barrel with a nice clean bore. He next assembled the parts, whittled the stock with his own hands, and finally put the weapon together. He had made a gun!

Then, remembering his father's warning, he turned his home-made gun over to him for inspection.

His father, surprised at the result of his son's industry and mechanical ingenuity, examined the gun very closely. Then he put a light charge of powder in it (for it was, of course, a muzzle-loader), rammed home a bullet, and, aiming at the test-target, fired.

But it scarcely needed this test to prove to the old man that his son had fabricated a mighty good fire-arm — as good a gun as any he had ever made himself.

He didn't want to spoil the boy, so he merely told him he'd "done well." To his friends, privately, the veteran gunsmith reckoned that "Jack has made a better gun than I ever made." Such praise of Jack Browning's prowess as a gunmaker aroused great curiosity. Everybody wanted to see the gun and try it and quite a few wanted one "just like it." Orders poured in, and Jack pitched in with his father and brothers, thus beginning in earnest his career as gun-maker.

Jack became an expert shot with his self-made gun, and was soon supplying the family table from his game-bag. What with his shooting excursions, schooling, and work in his father's shop the youth led a busy life. He wasted no time, and, what is more, determined to improve upon his gun — to make a still better one. The same year he designed a breech mechanism (whittling it out of wood) that surprised his father.

Before he was twenty-five young Browning had made the first of his single-shot rifles, which was a great success. It was an improvement upon anything that had gone before, and he and his brothers made and sold about five hundred of these new models, for it became in great demand. Then one of the new weapons fell into the hands of an official of a famous arms company, which sent a man in hot haste to Ogden to find the man that made it.

The man that made the gun — and a very modest man, too,— was John M. Browning, as we have seen.

“Will you show me how it is made?” he was asked.

“Certainly,” he responded, and the official was amazed at the way they turned out these rifles by hand.

“Is it patented?”

It certainly was patented.

“Will you sell us the patent?”

Young Browning didn't know. He had made a good thing out of it. He was working early and late trying to fill orders. It seemed rather poor business to sell a patent that was keeping him in all the work he could attend to. But the man from the Winchester Arms Co.

named a sum that almost staggered the young inventor. So he sold his patent, and his design was the basis of the first Winchester single-shot rifles of all calibers.

Thus began John M. Browning's career as an inventor of firearms. It would take an expert in arms now to understand or enumerate all Browning's inventions. But it may be said that his work includes every rifle — from single-shot to repeaters — that the Winchester concern has produced; every gun made by the famous Fabrique Nationale, of Belgium; the Colt automatic pistols and machine-gun; Remington shotgun and repeating rifle; Stevens rifle, and the box magazine used by the United States in the Spanish War.

He is the wizard of firearms — a gun genius. His famous 1886 model rifle sent all others to the scrap heap, so superior it was; and the 1890 model of his lever shotgun, which he invented, has outsold all other models of its kind in the world. He was responsible, too, for radical changes in rifle calibers. Most of us to-day can remember the .22, .32, .38, .40 and .44, which seemed as set and permanent as the everlasting hills. But Mr. Browning developed such calibers as the "30-30," the "25-20," and others known to sportsmen the world over.

For many years the bright nickel barrel and the round, revolving chamber marked the revolver. To-day that type is not so familiar. We see more and more that ugly, flat, cold-blooded looking weapon made and automatically shoots to kill. It is the work of Mr. Browning.

One day Mr. Browning took a square piece of oak,

bored a hole exactly the size of a .40 caliber rifle against it so that the bullet would go through the hole, and tried an important experiment.

He had figured out that there was a great deal of wasted force in the gas caused by the combustion of the powder. He wanted to make sure how much force there was to this. He took no chances, but fastened the rifle against the board, attached a cord to the trigger and yanked.

Fortunately, it was a long cord, because the force of the gas knocked the rifle back half way across the room. This was the basis of his automatics, the basis of his famous Browning gun which, during the war, was turned out wholesale and shipped to France.

At the time Mr. Browning made his test he was asked about it.

"I'm trying to harness the 'kick,'" he declared, solemnly.

They laughed. It was "one of John's jokes," they said.

It was a joke that changed history. For very soon Browning utilized the power of the gas in such a manner that a part of this wasted pressure was transferred to the breech mechanism and made to operate the gun. One pull of the trigger and the rebound fired the weapon a second time, this rebound fired it a third time, and so on until he soon had a gun that, with a single pull at the trigger, would fire six hundred bullets in less than a minute!

The outcome of these experiments was the automatic firearm, or the famous old Colt's machine-gun, at the

time one of the best in the world. It was adopted by the United States Army and Navy and was the only machine-gun we used during the Spanish War. During the Boxer uprising in China a detachment of our marines with only two of these Colt's machine-guns — Browning's invention — saved the foreign legations from destruction and the inmates from butchery.

In 1914, at the outbreak of the world war, the only plant in the United States for the manufacture of machine-guns was turning out this weapon, and quantities of them were sold to the Allied Governments.

When matters began to look as though we would get into the fight there came a demand from our Ordnance Department for machine-guns. Experts began investigations. The Lewis gun was conceded to be a "wonder." It did terrible execution. But there was one drawback, it was claimed: even the lightest of these Lewis guns could not be fired by a single man except under the very best of circumstances. And in our present form of warfare there's no such thing as any "best of circumstances."

Meanwhile Mr. Browning continued to "putter" about his workshop in Ogden. He was working on an improvement of the machine-gun.

This Wizard of Firearms has never been content to sit back after one big achievement and rest on his laurels. Sometimes he takes a bit of a fishing trip by way of rest, then back again to his shop to try to make still better what has just been conceded to be his best.

He knew what was wanted — a rifle as light as the

average service gun that an enlisted man might use as he would an ordinary rifle and yet, by a single pressure of the finger, pour an endless stream of bullets into the enemy.

This was out of the question, of course. But he did the next best thing — he perfected a machine-gun that is no heavier than the average rifle sportsmen use for moose and bear. In fact, a lighter rifle than that used by African hunters for the biggest game — yet this machine-gun that he turned out can be lifted to the shoulder as any gun and forty bullets poured into the enemy in less than two and a half seconds — like water from a garden hose. Then he invented a heavier machine-gun, water-cooled.

February 27, 1918, was a great day in the history of machine-guns, for this was the day the Government tested the new Browning invention at Washington. More than three hundred witnessed the tests, including British, French, Belgian and Italian army officers, our own army officers, many Senators and Representatives, and, of course, writers for magazines and newspapers.

“A success!” was the unanimous verdict. And Secretary of War Baker remarked:

“It has paid us to wait, for we now have the very best machine-gun in the world.”

The lighter gun was first tried. Weighing only fifteen pounds the “little one” shoots twenty or forty bullets at one time. One move of a lever cocks the weapon, one pressure of the finger discharges it, and the shots pour out as fast as one can follow another from the muzzle. It is air-cooled and works of itself,

automatically, after the first shot, by means of gas pressure.

A soldier using this gun could spray an advancing enemy with forty bullets before he could fire six with an ordinary repeating arm. The only tool necessary in taking the gun apart is the edge of a cartridge. One man operates it quite alone, feeding the clips and shooting.

A hundred men, each armed with this gun, could destroy a couple of regiments. Or for advance, nothing could stand up under them.

The wicked weapon, however, is the Browning heavy machine-gun. This is water-cooled and works on a tripod, but it weighs only thirty-two pounds. In the test twenty thousand rounds were fired without a break or a malfunction of any sort. In another test out of twenty thousand shots there were but three misses, due each time to a bad cartridge. In a supreme test, thirty-nine thousand five hundred shots were fired in such instantaneous succession that the report sounded like one noise. Then the gear gave way. But no such test would ever be made in actual warfare, as such guns are worked in pairs, one to rest, cool, be reloaded and set back in place while the other is operating. This gun is to be used for aviation service, stripped of its water-cooler jacket, as the air will serve as a cooler. In this shape it weighs but twenty-two and a half pounds.

The details of this test are history. They astounded the world. The verdict from every one, everywhere, was:

“This is the best machine-gun made.”

It was fifty-two years ago that John M. Browning made his first gun. He has been making them, inventing new ones, improving old ones, ever since.

And for the first time in his more than half a century of gun-making he has permitted his name to be used in connection with a firearm.

It is little wonder that he was not widely known. It is little wonder that many people looked askance when it was announced that the Government had adopted the Browning gun. Go to any big gun manufacturing concern in the world and use his name and you will find out that this man is known. It is said that there was not a firearm plant in the world of the modern type but what, before the present war, was paying some sort of a royalty to a "Yankee chap named Browning."

"Browning?" they would repeat, "ah, yes; the American wizard of firearms. See — this gun, and that one — this appliance, that improvement. His! We must pay him a royalty to use it!"

The great wizard of electricity, Edison, since the day he sold papers on trains and rigged up a tiny laboratory in a baggage car, has made no greater strides, up to now, than did Browning, from the day when, a thirteen-year-old boy, he turned out his first gun on an old wooden foot-power lathe up to his latest achievement, the "Browning machine-gun."

His income from royalties on his inventions is naturally enormous, and estimated at \$1,000,000 a year. But he still keeps up his habits of industry and simple tastes.

If you stroll into his shop some day, you're sure to find John M. Browning, the "gun wizard," in overalls and jumper at a bench whistling as he toils away on some new device for weapons. If he is at home you'll likely find him in a plainly furnished living-room in a rocker playing "Blue Bells of Scotland" on his beloved banjo.

The two things he likes best to do are tinkering with firearms and playing the banjo. For sport he likes a mountain stream and a hatband full of trout flies, and, in the hunting season, he goes up in Wyoming after bear and other big game.

A fine upstanding man is Browning, the "gun man" — six feet three inches tall, straight as an Indian, and as active and vigorous as a young man of thirty. He never "cottoned" to citified ways, prefers ready-made clothes, and a very narrow straight collar.

When, after we entered the war, it was announced that the War Department of the United States had adopted the "Browning machine-gun," the cry went up "Who is Browning?" Though he had been inventing firearms for many years he had never put his name to any of his models, and nobody knew this man of Ogden, Utah.

"Ogden!" one official would exclaim with a supercilious smile. "Queer place for a machine-gun to hail from! — If it had been Ilion or Bridgeport —"

It did seem absurd, for up to the time that John M. Browning — the gun-boy of Ogden — perfected his new machine-gun his name had not appeared on any of his guns. None the less —

Every Winchester rifle; every Remington shotgun; every Remington automatic rifle; every Colt machine-gun; every Colt automatic pistol (such as our army officers carry); every one of the million army pistols manufactured by a Belgian concern — every one of these, and more, WAS A BROWNING GUN!

He invented all of them!

And of the millions upon millions of these firearms, known and carried in every quarter of the globe, not one bore his name.

There was a time when Wilhelm Hohenzollern proudly carried a handsome pistol presented to him by Albert, King of Belgium.

John M. Browning invented it.

When Admiral Robert E. Peary planted the Stars and Stripes at the North Pole he had a Winchester repeating rifle, model '92, in his hand.

John M. Browning invented it.

When, on that fatal summer day in 1914, a Serbian fanatic shot an Austrian Archduke to death and precipitated the world war, he did it with an automatic pistol.

John M. Browning invented it.

An Englishman of title, on a government mission to this country, had occasion to call on Mr. Browning at his home in Ogden. The English official bowed low.

“*Sir* John M. Browning?” he asked.

“John M. Browning, *sir*,” snapped Mr. Browning. The Englishman took the hint and called him “Mister” after that. However, the Englishman was correct. Mr. Browning has every right to be addressed as

“Sir,” because, early in 1914, King Albert of Belgium conferred upon him the decoration of “Chevalier de l’Ordre de Leopold.”

It is an attractive decoration — so it is said. Mr. Browning tucked it away in some mysterious place and never even exhibited it, much less wore it.

So it is of no use to look in the “Almanach de Gotha” or even in “Who’s Who in America” for information concerning Mr. Browning. His name does not appear in those interesting volumes.

Not one in a thousand, probably not one in ten thousand, who has carried Winchesters, Remingtons, Colts, Stevens, and such familiar firearms into the woods during the game season, or used them at target practice, coupled the name of Browning, when they read about his machine-gun, with their weapons. But despite the fact that various names and corporations appear on these guns, the man who created them, the man who modified and improved and simplified them, was this same John M. Browning.

There is no Browning arms plant in Ogden. There is a well-equipped shop where Mr. Browning “putters around,” as he himself phrases it, but he does not manufacture firearms. He doesn’t have to. He invents them and lets the other fellow manufacture them while he banks his royalties.

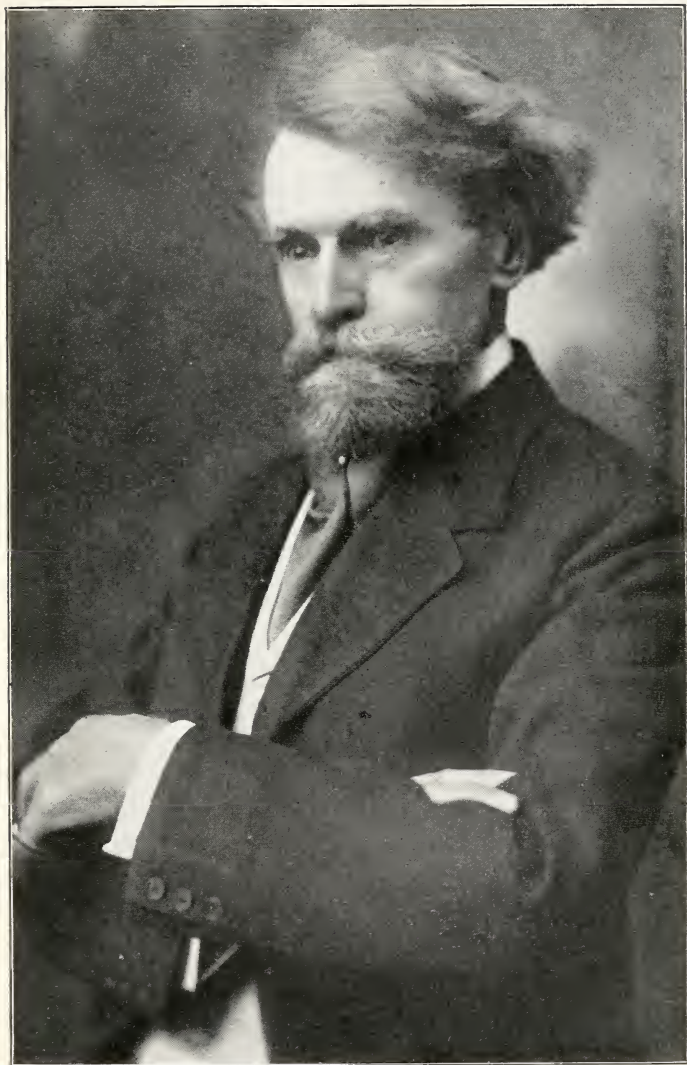
Sometimes a firearms concern wires him to come East and help on a model. He looks over their drawings, then over his own model to refresh his memory — he has made so many they are difficult to classify at a glance — and starts to make a few drawings himself.

64 FAMOUS LEADERS OF INDUSTRY

By night he has completed the work. They hand him a check for ten thousand dollars and a certain agreement concerning royalties, and back he goes to his little shop and his banjo.

While strumming on his banjo out in Ogden he is thinking up improvements on what is conceded to be the best machine-gun in the world.

WILLIAM ANDREWS CLARK
MONTANA COPPER KING AND UNITED
STATES SENATOR



WILLIAM ANDREWS CLARK

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MONTANA COPPER KING AND UNITED STATES SENATOR

IT had been snowing steadily for a month and Last Chance Gulch, the new Montana mining camp, was buried deep under a heavy white blanket. For a week or more no communication had been possible with the outside world, the camp was practically cut off and provisions were running low. It was getting close to Christmas, too, when the miners, scattered among the hills hard at work on their various claims, would gather in camp and "whoop things up" socially.

But Last Chance Gulch's isolation was unexpectedly broken one day by the advent of a two-horse sled bringing mail — and bad news! The steamer, with supplies for the camp — especially tobacco — had struck a snag on the Missouri River, and gone down with all her cargo!

This meant a tobacco-famine for Last Chance Gulch and there was growing excitement and anger among the red-shirted miners. Many were the lamentations and curses, for to the rough fighters of the wilderness tobacco was the most precious commodity that came to the camp. And then there was Christmas close at hand, a time of jollity and jamboreeing.

Just about this time — the early '60's — be it noted,

flour was selling at \$150.00 a barrel and ham at a dollar a pound.

Now there happened to be in the camp an unusually shrewd and courageous young man named Clark. Coming to Last Chance Gulch after two months' hard, dangerous travel with an ox-team, all the way from Colorado, he had staked out a claim and cleaned up \$1,500 the first season. But he had decided that there was more money — dead-sure money — at that time in trading than in gold-mining; so he had put all his capital into provisions, which he bought at Salt Lake City and sold to the miners for their gold dust. In a year the young trader's capital had increased to \$7,500.

Now, Clark, the moment he heard of the wreck of the *Prairie Belle*, saw a golden opportunity to double his capital within sixty days. He determined to get tobacco for Last Chance Gulch, or die in the attempt!

It was mid-winter, the thermometer twenty-three degrees below zero, when Clark harnessed his horse for his wild, dangerous ride of two hundred and fifty miles to Bois  City, Idaho, his nearest supply point. The miners gave the plucky young man a rousing send-off, but few among them ever expected to see him alive again.

When this lucky chance came, Clark had tried his hand at about everything in which he saw a chance of success. He had been teamster, miner, trader, and had lived a life of incessant and arduous labor. Bent double, he had "panned" gold wherever there was a likely stream, up to his middle often in icy water; he had driven ox and mule-teams through an Indian-in-

fested country, once three hundred miles through the roughest kind of wilderness, so by this time he was injured to all sorts of weather and hardships, and as hard as iron physically. Yet to most people his expedition seemed doomed to failure.

“He’ll never get through in this blizzard!” said a grizzled old forty-niner.

But on January 1, New Year’s Day, Clark rode triumphantly into Last Chance Gulch with two thousand pounds of tobacco in his wagon which had cost him three thousand dollars. He sold it for ten thousand dollars and was the most popular man in Helena.

“It was,” he once said, “the worst ride of my life. The snow was deep everywhere, my horse could hardly get through. A dozen times I thought it was all up with me, but I stuck to my saddle and my horse was a fine brute. It was really he who pulled us through.”

In another year he was doing a wholesale tobacco business all over central Montana, and had gained such a reputation for honesty and square dealing that large sums of money were entrusted to his keeping by the miners, for, of course, there were no banks in the camp then. Another of his famous “deals” was in baking-powder, after which the “boys” called him “Baking-Powder” Billy.

This gritty young man, William Andrews Clark, destined to be one of America’s wealthiest men, was born on a farm near Connellsville, Pa., on January 8, 1839. All the education he received was in the common schools, and, like all farmers’ sons, he had to work on his father’s farm in summer, attending school in

winter. His grandfather was of good old Irish stock, and from him the boy inherited his qualities of thrift and industry. His grandmother was of French Huguenot descent, and to her he owes the pronounced artistic instincts which found expression as soon as he became wealthy.

In 1856 the family moved to Iowa, where the boy worked on the farm and studied law at the University of Mount Pleasant. Then, having no money, he taught school for a while. But the humdrum life of a school teacher had little fascination for so energetic and ambitious a boy, and, becoming restless, he decided to go farther West and join the pioneers. Missouri, then a frontier State, was his first stopping-place, and there he caught the mining fever and traveled overland to Colorado, where, after working a quartz mine at South Park, he made his way, as has been told, to the newly-discovered gold camp, Last Chance Gulch, in the Banock district of Montana.

After young Clark's famous ride, which gave him the foundation of his fortune, he opened up other stores in the territory, continued his trading, making money all the time, even securing a mail route from Fort Benton to Sioux City, and later a Star route between Missoula and Walla Walla. Then he founded the firm of Clark, Larabie & Co., which, before long, became one of the largest jobbing concerns in the Northwest, and also opened a bank.

He had plenty of capital now, and, with his usual wisdom, decided that it was about time he examined the copper possibilities of the territory. First he secured

claims, buying some outright and some on options, and then to everybody's surprise, went to New York City to study mining and metallurgy at the Columbia School of Mines, for, with his usual shrewdness and thoroughness, he wanted to be able to find out for himself what was in his mines. It is not always safe, in the mining industry, to take "the other feller's" word for it!

He was thirty-three years old when he returned to Butte, the hub of the Montana copper region, where he installed at his copper property the first stamp mill. A stamp mill is a mill containing what is called a "battery" of stamps. The raw ore, embedded in rock or quartz, is fed into the battery along with a steady stream of water. Simultaneously, the enormously heavy stamps are rapidly jiggled up and down by machinery, falling, almost in unison, like giant hammers, upon the ore and pounding it to pulp. The refuse flows off in the sluice, the residue (metal) is saved. Formerly this crushing had to be done by hand with an ordinary hammer — a slow, costly process.

A stamp mill, needless to say, is about the noisiest, wettest, slimiest place on earth. The stamps, like a drum, keep up an incessant tattoo, drowning the roar of the ore dropping into the chutes, and water splashes about everywhere.

It was about this period that electricity began to be widely used as a motive power in place of steam. Mr. Clark again read the future correctly when he foresaw an enormous demand for copper for wires. So he hunted around for another copper property, examining

dozens of promising prospects in the course of his search.

In Arizona Clark stumbled upon the biggest piece of luck of his life. About thirty miles east of Phoenix was a group of claims which, he intuitively felt, were what he wanted. Riding his horse up to the owner's cabin, he asked him what he wanted for them. The owner looked at the little tanned, reddish-bearded man, and, laughing, for he thought Clark was joking, answered offhand:

“One hundred and fifty thousand dollars.”

“All right,” said Clark, “make out the papers, and I'll give you a check for fifty thousand dollars and the balance in thirty days.”

The camp was electrified when the deal went through, and Clark got the group of claims now known as the United Verde Mine — a copper mine that has been yielding him for many years a million dollars a month!

How did Clark arrive at his belief that there was a great deposit of the red metal in this precise spot?

Perhaps because he had studied mining and metallurgy at an Eastern school of mines, and knew a good deal about geology, and especially about geological formations local to Butte, his headquarters. He had studied the “outcroppings” in his region, the lava-like rock, or ore, that, ages back, bubbled to the surface of the earth, cooled and hardened. These “outcroppings,” if they contained mineral — precious or other metal — denote deposits of it below, perhaps close to the surface. And the deeper one digs, the purer and richer the ore in these deposits is.

This is how Clark knew the value of these mining claims he was buying, and his judgment was again correct.

Before long, Mr. Clark built a railway from his mine to the main line, erected smelting works to treat his own ore, and, as the number of his employees increased and stores were opened to supply them, the town of Jerome, Arizona, sprang up.

It is doubtful if Mr. Clark would take \$100,000,000 cash for his mine to-day. No one knows what United Verde stock is worth; there are no quotations anywhere and none for sale.

Wealth poured in upon the young man from Connells-ville rapidly now, and his reputation as a man of great ability spread throughout Montana. He was the Territory's wealthiest and foremost citizen, and, as such, represented Montana as orator at the Philadelphia Centennial Exhibition of 1876. In 1877 he was elected grand master of the Montana Masonic fraternity, and the same year was commissioned major of a Butte battalion that pursued Chief Joseph and his band of redskins in the Nez Perce war. In 1884, he was Montana's Commissioner to the New Orleans Exposition.

He was president of the Constitutional Convention of 1884, and of the second in 1889, in which year Montana was admitted to Statehood, largely through his efforts, though the previous year he had been defeated for Congress on the Democratic ticket. In 1890 he was elected to the United States Senate, but, through the machinations of powerful political opponents, including Marcus Daly, he was unseated, the Senate rejecting his

credentials. He was again elected Senator in 1899, but his election was declared void by a Senate Committee, so he resigned, submitting the matter to the people of his State. In 1901, he was reelected for the term of six years and at last took his seat.

Senator Clark's first wife, who had been a boyhood sweetheart of his Connellsville days, died in 1893; and the present Mrs. Clark was formerly Miss Anna E. Chapelle, of Butte. There is quite a romance woven around this second marriage, which would never have come about but for the Copper King's passion for music.

Anna's father, Dr. Theophilus La Chapelle, came from Montreal to Butte to better, first his health — for he had consumption — and then his fortunes. He soon died, however, leaving his family almost destitute. Of his children, Anna, a very beautiful and highly talented young girl, was his favorite, and, on his death-bed, when he confided his family to the Copper King's care, he laid special stress upon her wonderful talent for music, and deplored not being able to gratify her musical ambitions. The Senator agreed to look after his wife and children, and did. Anna was sent to the Boston Conservatory, where she shortly developed unusual musical talent, especially for the harp. He then sent her abroad to study under the best masters. For a few years, in Paris, she lived with one of the Senator's widowed sisters, and was very assiduous in her studies. By 1899, her fame as a harpist was spreading in artistic circles, and she received flattering offers to go on the stage. But the Senator wanted her to study another

year, so sent her to other great European musical centers and engaged special teachers for her.

Meanwhile, his fatherly feeling was changing to love and, in 1901, he married his young French-Canadian protégée at a small hamlet near Marseilles, France. For a while they lived at a retreat in the Pyrenees kept by Benedictine monks, and then in a magnificent villa at Cape Matifou in the Bay of Algiers.

Late in the year the Senator and his beautiful bride returned to the United States, where, on Fifth Avenue, New York, he built for her what is probably the finest private residence in America, if not in the world.

This wonderful nine-story house, a mass of comfort and luxury, cost \$10,000,000 simply to build. What its furnishings, fittings, art work and art objects cost in addition, no one can even guess — maybe another ten, maybe another twenty millions. For four rugs Senator Clark paid \$250,000, and he has paid huge sums for oil paintings, and then there are the ceilings from famous European palaces, the bronzes, the library, the organ, Turkish baths, swimming pool, etc.

To build this house, he bought no less than six industrial plants, including granite quarries; and one million pounds of bronze were used in the interior.

His art treasures include wonderful oil paintings, tapestries, statuary and bronzes, which he values very highly, but what he takes the most pride in is his priceless collection of XVIth century Persian carpets, of which he has forty-five examples out of only one hundred and fifty in existence.

Senator Clark was once asked to tell a boy how he could get on in the world — succeed in life.

“First,” he said, “carefully determine upon an occupation or profession, which choice should depend upon qualification and congeniality — for a man must have his heart in his work if he would succeed.

“The most essential elements of success in life are — a purpose, increasing industry, temperate habits, scrupulous regard for one’s word, faithful performance of every promise, perfect system in business so as to be in close touch with all details, putting nothing off until tomorrow, courteous manners, a generous regard for the rights of others, and, above all, integrity which admits of no qualification or variation.

“Then there must be unflinching courage to meet and overcome the difficulties that beset one’s pathway.

“If all these qualities be not inherent they can be and must be cultivated.

“Rather a host of qualifications, but the boy to make a thorough success in life must have them.”

As Senator Clark started life a poor boy, with nothing, and earned every dollar he possesses by the hardest kind of work in a wild, unsettled region where the utmost courage and stoicism were needed, not part of the time, but all of the time, his advice is worth pondering.

All the qualities he enumerates Mr. Clark himself possesses, coupled with unusual shrewdness, initiative and enterprise. “Nothing venture, nothing have” was his motto, and there were times in his career when he certainly took “long chances” — but he won out every time. He had the broad vision and remarkable opti-

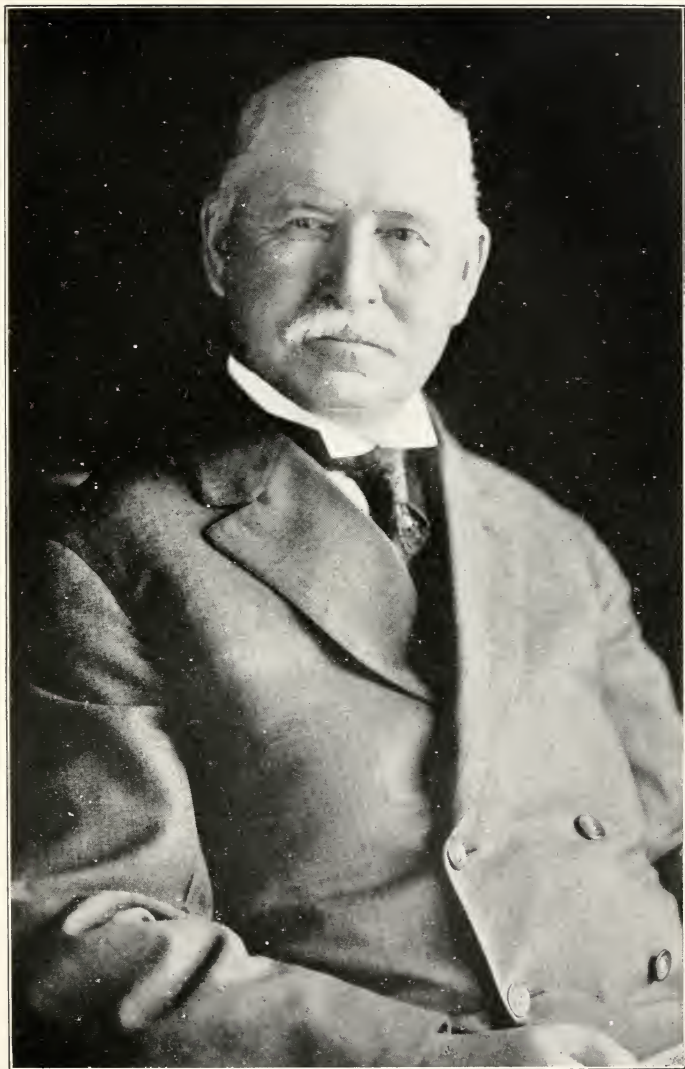
mism as to the vast hidden natural resources of our country that have characterized the most successful pioneers of the great American West.

Mr. Clark is a quiet, modest man and dislikes publicity. He silently pursues the even tenor of his way, and, looking at him, it is hard to associate him with the mighty mining, smelting, railroad and banking enterprises which he controls. Though enormously wealthy, he is plain, unassuming and democratic and has an astonishing memory for names and faces. Business and society won't mix, in Mr. Clark's opinion, and that is why he has never been a "social climber." When he has entertained, he has sought his friends among people of artistic inclinations, and lovers of art have always had free access to his wonderful houseful of art treasures.

Mr. Clark's Western residence is at Butte, Montana, the scene of his early struggles, and success. He has done a good deal for the town, in one way or another, and spends a great portion of his time there.

WILLIAM L. DOUGLAS

THE BOY WHO PEGGED SHOES AND
BECAME GOVERNOR



Photograph by Louis Fabian Bachrach

WILLIAM L. DOUGLAS

WILLIAM L. DOUGLAS

THE BOY WHO PEGGED SHOES AND BECAME GOVERNOR

THE career of the Hon. W. L. Douglas, Captain of Industry, Mayor, Senator and Governor, the founder and President of W. L. Douglas Shoe Co., reads almost like a romance. It is a striking example of what thoroughness and tenacity of purpose can accomplish, and a refutation of the opinion that there are no longer opportunities in the world for young men.

Few boys ever started out in life with less or worked harder in their boyhood than W. L. Douglas, for, when only five years old, his father was drowned at sea, and his mother was left with several children to support. Born in 1845, close to historic Plymouth, Massachusetts, where, in 1620, the *Mayflower* Pilgrims landed, he was, when only seven, doomed to a life of virtual slavery.

At this tender age — the age when most children are starting to go to school — W. L. Douglas was “bound out” to his uncle, a shoemaker, and put to work pegging shoes. Pegging shoes in those days was mighty hard work. There were no machines to sew or nail the different parts — it was hand work, work usually done by men or boys much older than he. In fact he was so small that he had to stand on a box to

reach the bench where certain parts of the work were done.

“Bound out” or “apprenticeship” at that time did not mean doing just what one wanted to do or short hours. It meant long hours and the doing of many things that seemed to have no bearing upon one’s trade whatever. Size or age was no exception to the rule for apprentices, and part of the work young Douglas was called upon daily to perform was to go into the near-by woods and gather fuel for two fires, besides pegging his usual quota of shoes. The storms and cold of the old-fashioned New England winters made no difference. This work had to be done and done without murmuring. Hard as this may seem to the High School boy who objects to arising in a cold room, it taught Willy Douglas the value of obedience and of doing what he was told to do, rightly, promptly and well.

The school-house was two miles distant, and at rare intervals, when there were slack spells in the work, he was permitted to trudge to school and learn what he could of the “three R’s.” It is almost needless to say that he was an apt pupil and improved his few educational opportunities to the utmost.

When he was eleven years old he returned to his mother because of ill usage. The following spring his mother made another agreement binding him out to his uncle. This agreement was to the effect that for young Douglas’ labor at shoemaking the uncle was to finish teaching him the trade, board and clothe him, permitting him to attend school in season and pay him \$5.00 a month. Here he stayed four years, but as this

agreement was verbal the uncle evidently did not consider it binding, and all the wages he received during this period was \$10.00. Many boys and young men who are working for several times more a week than he was to receive in a month and who think that there is no chance in the world for a boy, should bear in mind that tenacity of purpose, obedience to superiors and attention to details will send them up the ladder of success just as it did him, if they will persevere. He wanted to be a master craftsman, and the years that it took to accomplish this ambition were not considered. His eye was on the goal, with the result that at the end of this time he was master of everything that his uncle could teach him about shoemaking.

In spite of his skill at his chosen craft and the fact that he was a full-fledged journeyman shoemaker, having received only \$10.00 the past four years, and not finding an opportunity to work at his trade near his home, he decided to try a cotton mill at Plymouth for a while at the then large wage of thirty-three cents a day.

While working in this mill he had the misfortune to break his leg, and as he could not work he attended school, hobbing on crutches two miles each way. And glad he was to have a chance to go to school again, for he knew, better than many boys, the value of an education, however limited.

This brief experience in the cotton mill and some time spent doing chores for a farmer in the fall of 1861 for the privilege of schooling, board and clothes are the only periods of his long and busy life that have not been spent in the shoe industry.

Having learned the trade of making fine shoes, the desire of mastering completely every branch of shoemaking led him to work in Hopkinton, Mass., making men's heavy boots. Later he went to South Braintree, where he worked with the famous old-time bootmaker, Ansel Thayer. For three years he was an apt pupil of this master craftsman. Although possessed with the ambition to be a master shoemaker the desire for an education was still strong and while working here he attended private evening school, paying for the same out of his slender wages.

The opening up of the West at the close of the war appealed to him as an opportunity of seeing a little of the country and at the same time of plying his trade. Accordingly, he journeyed across the plains and located in the town of Black Hawk and, associating himself with Zephaniah Myers, famous as the best bootmaker in the West, continued his chosen vocation of shoemaking. While associated with Myers he learned the two things necessary to make him an all 'round shoemaker in every sense of the word. He already knew how to make shoes. Now he learned how to design or draft and cut, also how to fit them, and was soon known for miles around for the excellency of his work.

His fame spread to Golden City, Colorado, where Alfred Studley, an old Massachusetts shoemaker, was located. He sent for young Douglas and offered him a partnership in his store. In those days there were plenty of pesky Indians in this section of the West, as may be inferred from the following advertisement put out by the new firm.

INDIANS!

If you wish to run away from the Indians
don't go barefoot, but buy a pair of

BOOTS OR SHOES

OF STUDLEY & DOUGLAS

But though convinced of the value of retail experience and although the venture was a success, he preferred the manufacturing end of the business and sold out his interest.

“Any one can sell shoes,” he explained to his partner, “but I know how to make them. I'm going back home and try to save some money to start a factory.”

Studley laughed at him, but Douglas went back to Massachusetts.

At this time making shoes by machinery was coming more and more into vogue, and from 1870 to 1875 he superintended the Porter and Southworth factory at North Bridgewater (now Brockton) and familiarized himself with all the then known appliances for making shoes by machinery.

The year 1876 saw the beginning of the new mammoth shoe industry which bears the name of W. L. Douglas. Although thirty-one years old and married he had faith enough in his ability to give up working for others at a stated salary and start manufacturing in a thirty- by sixty-foot room in the building previously occupied by Porter & Southworth. His capital consisted of eight hundred and seventy-five dollars borrowed money and a firm belief that he could make a success of shoe manufacturing. His output was forty-eight

pairs a day and five employees constituted his whole working force.

This is the kind of nerve W. L. Douglas had!

The growth of the business from its start in 1876 to the present time is an astounding and romantic record of American enterprise and shows what thorough training, strict attention to business, honesty of purpose and a mastery of details can accomplish. At the start of his business venture Mr. Douglas was not only his own buyer, cutter and salesman, he was at times his own expressman as well. Old Brockton residents tell of seeing Mr. Douglas coming from Boston with rolls of leather under his arm.

Young men who want to succeed in life, but who watch the clock for fear they'll work a minute more than their regular hours, cannot do better than to make note of the fact that in those days Mr. Douglas frequently worked eighteen and twenty hours a day; returning to the factory many a night, after days spent in Boston buying leather and selling shoes, sorting and cutting leather and laying out the next day's work for his employees.

To this more than any other cause Mr. Douglas attributes his success. It was only by working practically day and night during these early years that he got his start and laid the foundation for his large fortune.

As a result of careful attention to details and hard work, the business grew to its present huge size.

Some idea of the present magnitude of the business Mr. Douglas started in to learn at seven years of age may be had from the following figures:

The business now employs more than four thousand operatives —

Uses the skins (hides) of one million eight hundred thousand animals —

More than one million yards of cloth —

Four thousand tons of sole leather —

And fifteen thousand miles of flax thread annually.

A year's output, if placed heel to toe, would reach from Boston to Omaha; if piled one pair on another would make a pile two hundred and fifty-six miles high, and if packed in cases and shipped by rail at one time would take five hundred and seventy-two cars and make a train six and one-half miles in length!

From the small beginning outlined above, the Douglas business has grown to tremendous size, and is a shining example of what thoroughness, honesty and tenacity of purpose can accomplish.

Although an extremely busy man, Mr. Douglas found time to take an active interest in local and state affairs and has served his city, Brockton, as councilman and Mayor and represented her in both the Massachusetts Senate and House of Representatives. He also has had the honor of being elected Governor of the old Bay State.

Because of his early training and rise from the ranks, W. L. Douglas has always been a champion of and exemplar of fair treatment for employees, and labor troubles, strikes and lockouts have seldom occurred in his factory, because of his willingness to discuss and arbitrate all matters in dispute.

It is due to Mr. Douglas' being able to see matters

from the workingman's standpoint that two of Massachusetts' best laws relating to the welfare of workers are on the statute books.

While a member of the Massachusetts Legislature he was the author of the state Weekly Payment Law, which directs that employees at manual trades shall receive their wages within each calendar week. In 1886 while a member of the state Senate he introduced the bill "to provide for the settlement of differences between employers and their employees." This bill was passed and was the immediate cause of founding, by legislative act, the State Board of Arbitration and Conciliation, one of the most effective institutions in existence for reaching and settling labor troubles. Following the fair and manly course of considering the well-being of his helpers, Mr. Douglas has always maintained the most cordial relations and enjoys their confidence and respect.

As Massachusetts was the first state to enact an arbitration and conciliation bill and establish a state board to carry out its features, Mr. Douglas enjoys the distinction of being the father of this legislation in the United States.

Mr. Douglas is a humane man, and, as accidents will happen, he long ago installed a medical and surgical department at his plant. The surgical department of his company is said to be one of the finest and best equipped of its kind in manufacturing circles in America.

Such is a brief sketch of this New England Captain of Industry who, as a poor boy, was put to work pegging

shoes at the age of seven and who rose from the ranks until he was president of a great corporation and a public official.

Known and respected the world over and honored by city and state, ex-Governor Douglas at seventy-four may still be found at his desk directing the business of one of the largest fine-shoe manufactories in the world.

His career is certainly one of inspiration to the youth of the world — particularly Young America. For in this land there are countless opportunities for young men of ambition, thoroughness and honesty. What has been done can be done again if one only tries.

JAMES BUCHANAN DUKE
AMERICAN TOBACCO AND CIGARETTE
KING



JAMES BUCHANAN DUKE

JAMES BUCHANAN DUKE

AMERICAN TOBACCO AND CIGARETTE KING

MANY great businesses have been built up from very small amounts of money — a few thousands or a few hundreds of dollars. Some have been built up on a capital less than one hundred dollars. The man who is bright enough to recognize and seize a good opportunity, or who has a good idea and sufficient faith in it and industry to work or develop it, seldom needs much, if any, capital. The famous Steel King and philanthropist, Andrew Carnegie, the Scotch bobbin-boy, not long after coming to America borrowed \$5,000 with which, in less than half a life-time, he built up the biggest steel manufacturing works on earth, selling out eventually for a sum so vast that if divided up among the population of the world, each inhabitant — man, woman and child — would get twenty-five cents! But this story is about a business now representing an invested capital of half a billion dollars, that was built up on an original capital of fifty cents.

Washington Duke was the father of the Tobacco King, James Buchanan Duke, now the head of the British-American Tobacco Company.

When the Civil War broke out Washington Duke, whose ancestry was Down Eastern, was living very sim-

ply on his three-hundred-acre farm near Durham, North Carolina. Selling his stock and crops, taking his pay in tobacco, he sent his wife and children to a relative's, and for two years served in the Confederate Navy. The war over, Washington Duke found himself at New Bern, stranded. His only possession was a five-dollar Confederate note. As he was tramping the one hundred and thirty-five miles to his ruined farm, he met a Union soldier to whom he sold his five-dollar note, as a souvenir, for fifty cents.

When he reached the farmhouse he found that his tobacco — his sole capital — had been looted by the soldiery; so all he had with which to begin life again was the fifty-cent piece the Union soldier had given him. What he bewailed as a misfortune, however, turned out before long to be a big piece of luck; for when the Northern soldiers reached home, and had smoked up the looted tobacco, they wanted some more, and began to write to the postmaster at Durham for additional supplies of the same delicious kind they had found on the farm close by.

Washington Duke was thankful indeed to receive the small sums accompanying these occasional orders, and he began to wake up to the unusual qualities of North Carolina tobacco. He filled all these Northern orders with great alacrity, and, buying two blind mules and a wagon, on credit, he went about the State peddling his tobacco. Then his three sons, especially James, began to help him, and between them they planted, gathered the crop, dried it over beechwood fires, and shredded or granulated it with their flails in the barn. They

were all big, strong boys, full of energy and ambition, sharpened by fear of the "wolf."

Their petty dealings soon grew into something like a business, though a very small one, and they found themselves hampered by lack of railroad facilities, so they moved to Durham, in 1870, buying an old two-story building as warehouse and residence combined. By 1874 they were able to build a small factory.

Washington Duke's youngest son, James Buchanan, though under twenty, was the hustling, aggressive business getter of the firm. His father and brothers grew and manufactured the wonderfully sweet and fragrant Carolina tobacco, but it was James who sold it. James, later the organizer and head of the American Tobacco Company, was outside man, and his splendid physique and tireless energy brought him great success as a salesman. Jamming his grip so full of samples as to leave scarcely any room for clothes, he rushed about the country, impatient of every delay of trains or other obstacles, placing "Durham" tobacco, as it was called, in cigar stores countrywide. There was literally no resisting the young man's energetic, almost fierce, appeal, and the most hidebound dealers succumbed to Jimmy's onslaught, and he booked their orders.

His father and brothers were dumbfounded at the boy's terrific industry and growing success. He was working day and night on the road, taking no pleasure and very little sleep, and sending in orders in increasing volume for "Duke's Durham." The business was growing fast, and Jimmy, the last born, was rapidly becoming its head and front — its soul.

James B. Duke, almost as soon as he started out to sell tobacco, came to a shrewd realization of the value of advertising. As he was a born trader and organizer he presently hit upon clever ideas for advertising and increasing the sale of Duke tobacco. Some of his schemes were startling to the conservative, and almost savored of "plunging." But the more he spent in these clever and revolutionary publicity schemes the more he made. Advertising of the kind that James B. Duke planned, *paid*.

It would be hard to find a young man who was more absorbed in his business — to the utter exclusion of all else — than James Duke. It was this single-mindedness that led him to world-wide fame and a big fortune. He had one idea — that of selling Duke Brothers' tobacco — and he stuck to it with even more than bulldog tenacity. Nothing outside his business — selling Duke's tobacco — interested him.

Fortunately he had a constitution of iron upon which his habit of excessive work had no effect, and, besides, he knew all about tobacco, for when only nine years old, on his father's return from the war to his ruined farm, he had to tend the tobacco plants in the fields and help rid the farm of weeds and rubbish accumulated during its abandonment. He helped out, too, in the curing shed, learning while a boy the secret of curing the leaf so as to give to it its rich golden-yellow color and delicious flavor.

Tending the plants, pulling up the weeds, cleaning up the farm of the damage and rubbish left by Sherman's boys, was hard work for the youngster. But the

whole family had to work, and, at the end of the year, the result was a crop from which they realized only forty dollars!

Nevertheless, insignificant as the reward of all their toil was for this first year after the war, it filled the three brothers and their father with renewed courage, and it was the foundation of what grew to be one of the largest businesses in the world. This bright, mild and fragrant tobacco, of which the Northerners were so fond, became the basis of an industry bringing in some fifty millions of dollars annually.

Other farmers near Durham now began to raise tobacco and the Dukes shrewdly gave up its cultivation themselves, devoting their whole time to curing and selling the leaf. Soon they had a small factory and were employing thirty-five men. Their profit the first year was \$7,000.

At this time James was only eighteen, and had not been inside a school since he was nine. He was a bright, quick-witted boy, strong, healthy and fond of work. So his father gave him his choice of a college education or a partnership. The boy didn't waste much time in pondering this proposition. He could read and write and figure, could put up a pretty good business talk, and he knew all about tobacco, for from childhood up he had been playing or working among the tobacco plants or in the little log hut where the family "cured" the golden leaf.

He instantly decided to take the partnership and continue at work, for his consuming desire was to make a fortune.

Later his father retired, the firm became Duke Brothers, and in five years their plant covered ten acres of ground, becoming one of the most important industrial concerns in North Carolina. This prosperity and expansion were due to James B. Duke's extraordinary energy, ambition and business acumen. No matter how much profit the firm made, he insisted upon nearly all of it being put back into the business. The partners were allowed to draw only \$2,000 a year each. Long after prosperity came to James B. Duke he continued to work as hard as any of his "drummers," living quite simply and economically in a boarding-house.

In 1881 the Dukes began the manufacture of the now so familiar paper-covered cigarettes, and about 1884 James B. Duke came to New York to see if he couldn't solve some problems in connection with their production and sale. Cigarettes were hand-made then, and the cost of manufacture stood in the way of their profitable marketing. Duke set some inventors to work, and a somewhat crude machine was made, but its work was imperfect. Then, although bankruptcy was predicted for him, he gave the machine to some mechanical experts to experiment with, at last succeeding in getting a machine that would make thousands of perfect cigarettes in a day. When Duke began to sell his machine-made cigarettes, he had all the other manufacturers beaten, and there was soon a rush on their part for similar machines.

About this time one of his friends asked him how much he had made.

"Some \$2,000,000," he replied.

“And how much of that have you got left?” the friend asked.

“A few thousands — I’ve spent the rest in planning for what I’m *going to make* in the near future,” was Duke’s reply.

This was where James B. Duke displayed his financial and business genius. With amazing foresight, he saw a wonderful future for his business. It was still in its infancy, and he saw the time when Duke’s tobacco and cigarettes would be on sale the world over. And this is why he always insisted upon the profits being put back into the young but fast-growing business. So, still living quite simply, spending nothing on himself, he poured his large profits back into his business, especially into advertising. He said once:

“I’ve spent more money in advertising than any other living man. . . . I’ve given out fifty million dollars to make my goods known.”

The quick seizing of opportunities was Mr. Duke’s most striking characteristic. It was a young Virginian, as the result of a chance remark, that set to work and, in a year, when only twenty-one, invented the cigarette-making machine, which Mr. Duke so promptly snapped up and improved. It took courage as well as cash to grasp this opportunity, for everybody predicted failure.

Mr. Duke grasped another opportunity in the foreign field when he invaded England with his cigarettes, spending money like water in advertising and other very sensational methods of competition. He met with a long and stubborn resistance, his most formidable

rival offering to divide among retailers offering their tobacco for sale, a bonus of \$200,000 every six months.

Mr. Duke, whose English branch was known as "Ogden's Limited," immediately announced that he would divide the entire profits every six months, plus \$500,000, among the retailers, and that this would continue for four years!

The British tobacco men saw nothing for it but to buy out the Duke intruder, and this they did at a price that made people gasp. Meanwhile the public had been benefiting greatly by the cigarette war, getting their smokes at an absurdly low price. And, needless to say, Duke's "Cameos," in their dainty little decorated cardboard boxes, were all the rage.

This stiff cardboard box for cigarettes was another inventive-opportunity whose value was instantly realized by Mr. Duke. As soon as he saw it he ordered fifty thousand and within a few months was buying them in million lots. Previously the cigarettes had been wrapped loosely in packages, and were easily crumpled and broken in the pocket.

When, in 1890, the Duke firm of Durham, North Carolina, joined the consolidation of tobacco companies they received \$7,500,000 for their business, and the very first year it earned twenty per cent. on its purchase price. As a matter of course James B. Duke, once the bare-legged nine-year-old boy who tended tobacco plants on his father's farm, was chosen to be the president of the consolidation called the American Tobacco Company, with its many millions of capital. No better man in the world, in the opinion of the owners

and directors of the new corporation, could be found than "Buck" Duke.

A few years ago Mr. Duke bought some land at Somerville, New Jersey, and with characteristic energy and originality set to work and built a magnificent mansion and surrounding estate costing \$15,000,000.

The land was flat, Mr. Duke noticed. "I want a mountain!" he exclaimed.

This was considered a good joke. There were no mountains nearer than a great many miles, and it was declared impossible to remove any of them to Somerville.

"I'm serious," he repeated, "I want a mountain!"

And a mountain he got! Little by little the mountain rose from the plain, getting larger and larger from week to week, when it was finished rising one hundred feet and covering about twenty-five acres.

Then he wanted lakes to go with the mountain, and got them, too.

In addition to this superb country estate Mr. Duke bought a fine residence on Fifth Avenue, New York.

"The one straight road to success," Mr. Duke says, "is to learn to love your business . . . the man who works only because he is paid to work cannot compete with the man who works because he would sooner do that than anything else. It is the practical secret of success."

James Buchanan Duke has done more for the American tobacco industry than probably any other man. At sixty-three years of age, he is still the Tobacco King of the American continent.

GEORGE EASTMAN
WHO INVENTED THE KODAK AND
POPULARIZED PHOTOGRAPHY



GEORGE EASTMAN

THE NEW YORK
PUBLIC LIBRARY

ASTOR LENOX TILDEN
FOUNDATION

GEORGE EASTMAN

WHO INVENTED THE KODAK AND POPULARIZED PHOTOGRAPHY

AN astounding story of toil, trouble and disappointment leading up to final dazzling success is that of the poor Rochester, N. Y., boy, George Eastman, who invented the Kodak, and whose name and fame now fill the earth. Starting his business life without a cent, at a wage of \$3 a week, George Eastman's factories now cover many acres, and in his pocket jingle millions of dollars.

Wonderful pluck, perseverance and gumption had this Rochester boy, and rich was his recompense; but his best reward is in the delight, pleasure and utility his photographic invention brings to countless millions of human beings.

George Eastman was born at Waterville, Oneida County, N. Y., on July 12, 1854, and a year or two afterwards his father located in Rochester, where he founded a commercial college. He was one of the pioneers in the idea that youths should have practical training in commercial methods before entering business life. In 1860, however, when George was only six, he died, leaving nothing, and the boy's mother had great difficulty in providing for his keep and schooling.

However, he was able to attend public schools until he was fourteen, when he started in as office boy in an insurance office at \$3 a week. It seemed "big money" to the poor boy who was so well acquainted with hard, grinding poverty; but the early lesson had a salutary effect, for the boy stood in such dread of the "wolf" that he determined to save all the money he could. At the end of his first year of work, although he had given his mother a good part of his earnings, he had managed to save and put in the bank the sum of \$37.50.

George, as well as being thrifty, was industrious and diligent in his work, and before long was getting \$600 a year. His employer appreciated his abilities, and knew that he was worth more than he could afford to pay him; so he helped him to get a position as book-keeper in the Rochester Savings Bank at a salary of \$1,000 a year.

Then followed several years of hard, confining office work for young Eastman, and, his health not being very good, it was decided to give him a vacation. At that time Santo Domingo was greatly talked about, for the reason that Uncle Sam was thinking of establishing a naval base there. It was a little-known and far-off country in those days, so George decided to spend his holiday there.

He was telling a man he knew, an engineer, about his contemplated trip, when his friend said:

"Why don't you take a photographic outfit along? Then you can take pictures of all the interesting places and things you see on your trip."

This offhand, random suggestion had a revolutionary

effect upon George Eastman's life, ultimately being the means of bringing him fame and riches.

The suggestion so deeply interested young Eastman that he at once started in to learn all he could about photography. After he had mastered the rudiments he bought a small camera, and hired a photographer in town to teach him the wet-plate process.

He had made considerable progress in his new study when he was detailed by the bank on some special work, and had to forego his vacation. By this time, though, he was so deeply interested in photography that, later on, he took a short trip to Lake Superior, taking his outfit with him. He succeeded in taking a number of pictures, but the process, as it was then, seemed to Eastman slow and cumbrous. On his return home he continued studying and experimenting and his first invention in the photographic art was a compact, easily portable outfit. Then, as he read the photographic journals, he heard of the discovery in England of the gelatine dry-plate process.

Eastman became more interested than ever, and went on experimenting, for it seemed to him that a large business could be done in manufacturing dry-plates, instead of merely the materials needed in the wet process. In other words, in a flash of intuition, he saw that if he could relieve the buyer of the necessity of handling the raw materials — nitrate of silver, collodion, and the glass — of having to bother with a dark tent and the whole slow, complicated and delicate process, he would have perhaps a fortune in sight. He determined to experiment on a larger scale along the lines of his

idea, which was making photography available to the masses. So, for a few dollars a month, he hired a room for a workshop, getting a young man to look after it during the day — for he was still clerking at the bank — doing the delicate chemical experimental work himself at night.

Toilful days followed for Eastman, and he frequently worked all night without taking off his clothes, sometimes sleeping from Saturday night until Monday morning. His dry plates, however, were a success, and a demand, greater than he could meet, was springing up for Eastman Dry Plates.

The secret of the superiority of his plates was due, he once said, to his formula. He happened to hit upon a very good combination more or less by luck. It was necessary for him to secure great sensitiveness — which only a handful of men in the whole world had been able to do — and by ceaseless, tireless experiment, George Eastman had discovered the secret.

Mr. Eastman now began to sell his improved plates to his old teacher, the local photographer, and through him secured another and large customer in New York.

Now convinced of the superiority of his plates to anything of the kind on the market, he began to advertise them. Orders rapidly poured in.

In 1881 he left the bank and organized the Eastman Dry Plate Company, taking in an old friend, Henry A. Strong, as partner, and quarters were secured on Vought — now Kodak — Street for the infant manufacturing firm.

For a while they were very prosperous, their sales

reaching about \$5,000 a month. But when spring came, wholesalers or jobbers who had bought plates in large quantities, keeping them in stock, through the winter, began to receive complaints. The plates were of poor quality — no good — so customers said.

Mr. Eastman at once started to investigate, and soon discovered that with age the plates lost much of their sensitiveness. He had to take back from the dealers every unsold plate, and, to crown all, he then found that his formula would no longer work! He could not produce a single good plate with it. It was baffling, mysterious, heartbreaking — and it was the same formula, too, that he had used in the beginning.

There was nothing to do but call in all his outstanding stock, and close the factory. It looked like utter ruin. “Compared with what I then went through,” said Mr. Eastman once, “all the later troubles of my life have been as nothing.”

Adversity, though like the toad “ugly and venomous, wears yet a precious jewel in his head,” and this is what Eastman found. The adversity into which he was so suddenly plunged only served to draw out his latent qualities or talents. His determination and courage increased, more plans and ideas came to him. He never lost hope.

Then George Eastman suddenly disappeared.

Weeks passed, but still his factory was closed — not a wheel turned. People smiled as they went by.

Meanwhile George Eastman was in England, practicing in the factory of a Newcastle firm on a formula he had bought from them. After he had thoroughly

mastered it in every detail, he hurried home, starting up his plant without the loss of a moment.

His plates were satisfactory now, and business began to increase by leaps and bounds. Everybody wanted Eastman plates.

It was this awful crisis, out of which he had emerged at last so successfully, that turned Mr. Eastman's hair gray. It was such a close shave for him that he could not rest until he had discovered why his formula had failed. He finally solved the mystery — it was in the gelatine he had been using. No other gelatine he bought anywhere gave him the good results his first lot did — why, he could never find out.

The dry-plate business of Eastman & Strong was now prospering, but competition was springing up all around and, by 1884, business was bad and the outlook gloomy.

Mr. Eastman, with remarkable foresight, had anticipated this, however, and had started experiments with film photography. He had visioned the contrivance soon to be known the world over as the KODAK — a word of his own invention. He knew that if only he could make so small a self-contained photographic apparatus, there would be no limit to the demand for it. So he engaged the services of William H. Walker to assist him in experimenting. Between them, they at last perfected a method of film photography, and Mr. Walker went to Europe in 1885 to introduce it there. First of all, however, was incorporated the Eastman Dry Plate & Film Company.

In 1888 came the first Kodak, and at last the hith-

erto dark and mysterious field of photography became an open book for amateurs. This first Kodak was fitted for one hundred exposures and took a picture two and one-half inches in diameter, but it proved a bit troublesome to amateurs who mostly had to return their exposed films to the factory to be developed. This, also, Mr. Eastman had anticipated, and by 1892 he had perfected and patented a machine by which his company could make a film roll with a transparent support taking the place of paper.

Once this process was perfected, and the new film put on the market, things began to hum at the Eastman factory and before long there was a tremendous expansion of the business. Where there had formerly been only a hundred or two photographic dealers in the country there were now some ten thousand to fifteen thousand; and Mr. Eastman decided to start manufacturing photographic materials of every sort and description in addition to his films. Formulas, new ideas and patents were bought from time to time and, once in a while, some other company was absorbed. A research laboratory was also established, with a full staff under the direction of a well-known physicist and chemist, and everything that science and money could do to improve the art of photography, to simplify or cheapen it, was done.

To-day nothing is commoner than a Kodak, and a child can operate one that costs but a dollar.

It is not every inventor who is able successfully to exploit commercially his own inventions; yet this is what George Eastman has done. For many years, he

has been a very wealthy man, and his donations to his native place, Rochester, have been very large.

In 1900 he was a Presidential elector on the Republican ticket, casting his vote for McKinley and Roosevelt.

He is still unmarried, and fond of music, hunting and camping-out trips in the West. His hunting lodge is in Halifax County, North Carolina. His fine residence on East Avenue, Rochester, is said to have cost above a million dollars.

In April, 1919, his company, the Eastman Kodak Co., of which he is of course the President, distributed \$6,000,000 in stock to its employees. It will also continue its usual yearly wage-dividend of at least a million dollars.

Mr. Eastman has shown during his business career great cleverness and originality in his advertising methods. The short, snappy word *KODAK*, one of the best known trade-marks in the world, he made himself out of a few letters, after trying out innumerable real words. His phrase, "You press the button — we do the rest," in Kodak advertisements caught on like wildfire and came into popular use in connection with endless other things.

His career, like Henry Ford's, illustrates the value of an idea. George Eastman evolved a good idea, and he stuck to it patiently and persistently until he made it pay. Obstacles and difficulties that would have overcome an ordinary man only increased George Eastman's determination — and what he determined, he did.

He Kodaked the earth!

THOMAS ALVA EDISON
ELECTRICAL WIZARD AND WORLD'S
GREATEST INVENTOR

THOMAS ALVA EDISON

ELECTRICAL WIZARD AND WORLD'S GREATEST INVENTOR

ALIVE wire, a bunch of irrepressible energy and curiosity was the boy Edison. He devoured all books within reach, and when ten years of age was reading Hume's "History of England," Gibbon's "Decline and Fall," and encyclopedias. Books on chemistry fascinated him and he was always experimenting to "see what would happen." It is amazing that such insatiable curiosity as he evinced on more than one occasion did not end fatally for him.

He was, for example, one day curious to see what would happen if he built a fire in a certain barn near his home. The whole building went up in flames, and Tommy was soundly whipped in the village square as a "terrible warning" to all other boys, good or bad!

What he learned from this experiment is not recorded.

When only six years old the boy's dominant trait — perseverance — was beginning to manifest itself and one day he disappeared. After a search he was found sitting on some goose-eggs patiently trying to hatch them!

From an early year he began to experiment with chemicals and, by the time he was twelve, had an extraor-

dinary collection in the basement of his mother's house. He spent what little spare time he had from earning a living down in his "laboratory" and he labeled all his phials and bottles POISON to make sure no one would meddle with them.

Cultivating ten acres of his father's farm was his job for awhile and this he accomplished with the help of another boy, selling as much as \$600.00 worth of produce in a year. Gratiot, Michigan, was where young Edison did his farming, but his birthplace was Milan, Ohio, where he first saw the light of day on February 11, 1847.

Thomas Alva was he christened, and his father, of Dutch ancestry, was farmer, lumber and grain dealer. While a child the boy's head had such a funny shape that the doctor predicted mental disturbances at no distant date. And so there were—but not of the kind the old doctor had in mind!

At school little Tommy Edison couldn't rise higher than the bottom of his class, so after a few months he was sent home as being too stupid to handle. The teacher said he was "addled"!

Not very many years after this humiliating incident, Hudson Maxim, himself a great inventor and learned man, said of him: "Thomas A. Edison is the most valuable man to mankind that ever lived."

But he had a long and thorny road to travel before becoming the world's greatest inventor.

Tommy did not go to school again. His mother, a very gifted woman, taught him at home and this is all the teaching he ever received.

He began his newsboy career on the Canadian Grand Trunk Railway when he was about twelve, his train's run being from Detroit to Port Huron and back. It was hard work for the boy, and he was up early and to bed late, getting mighty little sleep. But he was soon making money for himself, for he was a bright, likable lad, and had no difficulty selling his papers, fruit and candy.

As his savings increased, so did his ambition, and he opened a couple of stores at Port Huron, putting them in charge of other youths, and extended his newspaper business by putting newsboys on other trains. But these ventures did not pan out very profitably, so the young capitalist had the audacity to establish his laboratory on the train in a part of the "smoker" not used by passengers.

Meanwhile, the Civil War having broken out, the boy, who was always thinking and observing, noticed what an unusual demand there was for news. So he decided to print a newspaper of his own *on the train*.

Mr. Edison, reminiscing one day over his experience as a newspaper owner, said:

"It may seem impossible for a boy of thirteen or fourteen, with hardly a cent in the world, to talk of publishing a newspaper. This is how I did it. I found that a set of old type and a battered, much-worn hand press had been discarded at the office of the *Detroit Free Press*, and I managed to secure possession of them. Also, the railroad put an old baggage-car at my disposal for a supply room for my papers and magazines while on my trips. Here I set up my little plant and

began publication of the ambitious periodical which I called the *Grand Trunk Herald*.

“Of course, the journal was a decidedly amateurish affair, about twelve by sixteen inches in size, if I remember rightly, and confined to gossip of the line. I was my own reporter, editor, typesetter, proofreader and pressman. The railway men took an interest in my venture and soon I began to find myself supplied with a liberal variety of personal items of the Grand Trunk. Notices such as the announcement that the baggagemaster at the country station had broken his leg or that an engine had gone to the shop for repairs or that an excited passenger had lost his baggage might not be of general interest, but they tickled the railway men, and I found my circulation growing, so that I had to hire three boys to help me.”

When important war news came in, Edison induced the railway telegraph operators to announce his paper's contents on their bulletin boards ahead of his train. As a consequence he would sometimes find big excited crowds waiting for him, and he sold his papers at fancy prices — as high as a quarter a-piece.

It was at this period of his career that he divined, with his usual genius of intuition, the practicability and value of the telegraph in spreading news. He realized its enormous value to newspapers.

His paper was a great success, and in one year his profits amounted to about \$600.00. But calamity was close at hand, for one day while experimenting in his train-laboratory, the car rolled and jolted a stick of phosphorus onto the floor. Immediately the car caught

fire, and his laboratory and his *Grand Trunk Herald* went up in smoke. So enraged was the conductor that he threw Edison off the train at the very next stop, and boxed his ears so soundly that he has been practically stone deaf ever since.

His mother, who had great faith in him, now came to his rescue, giving him the basement of the house for his laboratory, and about this time he saved the life of a station-agent's little son, snatching him, in the nick of time, from in front of an approaching train.

So grateful was the father that he offered to teach the youth telegraphy. This was one of Edison's ambitions and he jumped at the opportunity. For some months by working about eighteen hours a day he mastered telegraphy, and built a line a mile long from the railroad depot to the village. He was then appointed telegraph operator at Port Huron, but his thirst for further knowledge of electricity was so strong that he used to become so absorbed in his experiments as to neglect sending or delivering messages. He was discharged for this neglect of his duties, and his next job, in 1863, was as telegraph operator at the Grand Trunk station of Stratford Junction, Canada.

From an early age Edison displayed unusual gumption. His brain seemed to work faster than most people's, and arrived at solutions of small and big problems instantaneously. He once gave an illustration of this wonderful faculty. Ice in the St. Clair River had broken the electric cable between Port Huron, Michigan, and Sarnia, Ontario, and no communication was possible. Edison, at the time a telegraph operator, jumped

on a locomotive at Port Huron, and began sending messages on its whistle. For some time no response to his "Hello, Sarnia!" came across the mile and a half of swirling ice-floes; but at last his signal was caught by the Canadian operator and he began getting replies by locomotive whistle. He thus established communication, without wires, between the two towns.

But again young Edison got into trouble through his passion for experimenting and inventing. We must remember, though, that he was only fifteen years old. To guard against operators falling asleep during the night they were required to send in a signal every hour. The boy thought it an unnecessary hardship to be kept awake, especially when there was "nothing doing," so he contrived a machine to automatically send the signal every hour. Then there was a collision and Edison fled over the border.

For about five years after this event he followed his occupation of telegraph operator, first in one place and then another, at last settling in Boston, where, among other things, he invented a stock-ticker. Business became very bad, however, and Edison removed to New York, leaving his books and instruments behind as security for his debts.

When he landed in New York City he hadn't a single cent, and his first meal in the metropolis was on some tea he begged from a tea-taster he ran across.

Now came the turning-point in the young inventor's career. Gold speculation was at its height and three days after his arrival in New York, he wandered into the offices of the Gold and Stock Telegraph Co., which

was furnishing the quotations by telegraph to their customers. As he was watching the ticker, it stopped working. In a few minutes it rushed, one after the other, a lot of messengers with the news that their masters' tickers had stopped! The head of the company, Dr. Laws, came in about the same time and it was found that the apparatus had broken down. There was great excitement, for ruin stared the concern in the face. To the amazement of Dr. Laws, Edison "buted in" with the guess that he "could fix it." The employees gaped aghast at the famished, almost ragged, youth's temerity. But he went right ahead and did fix it. The result was that he was made general manager of the whole business at a salary of \$300.00 a month the very next day. He could scarcely believe his ears when he was told the wages he was to get. It seemed a princely sum.

Edison now worked harder than ever on his ideas, and spent every minute of his spare time in experimenting. He soon was able to greatly improve the stock-ticker, secure a number of patents, and later founded the firm of Pope, Edison & Co., electrical engineers.

Then came another streak of luck. He had been doing work for the Western Union Telegraph Co., and they one day asked him how much he wanted for a certain patent. He was wondering if he dared demand \$5,000, when they asked him if \$40,000 would be a fair price. He thought it would!

Even after getting the check he was skeptical of his good fortune and in a fever of anxiety to cash it. When

he got to the bank there was a long line ahead of him. At last he reached the teller's window, and timidly pushed in his check. It was immediately thrown back to him, for he had not indorsed it. He had never had one before. The teller shouted something to him, which he was too deaf to understand, and, with his heart in his boots, and still believing he had been made a fool of, he went back to the Western Union and told his troubles to one of the officials. He laughed very heartily at Edison's suspicions and sent some one with him to the bank to identify him.

By way of a joke his \$40,000 was paid to him in five-dollar and ten-dollar bills, and Edison had hard work finding room in his pockets for all the bundles. After filling his pockets, he stuffed bundles down his neck next to the skin, and journeyed back home to Jersey looking very "lumpy." On the train, for fear of being robbed, he wouldn't let any one sit near him. At last he got home with his "vast wealth," but for three or more nights he couldn't sleep a wink, so fearful was he of being robbed. He was afraid, too, to leave his room in the day-time. At last he made up his mind he could stand it no longer. So, stuffing his \$40,000 in his pockets again, back he went to the Western Union to tell his trouble to his friend.

He was taken to a bank, his money deposited for him, and he got a check book. Then he slept better.

This was his opportunity to do what he had for long dreamed of doing. With the capital he now had he started a plant in Newark, N. J., to manufacture stock-tickers, and in a little while his business became ex-

tremely prosperous. His factory worked day and night, and this is what he did himself, taking snatches of sleep in his workshop instead of going home.

One of his first patents was an automatic telegraph capable of sending and receiving three thousand words a minute and recording them in roman type. He then took hold of the old Remington typewriter, and perfected it; later, in 1873, going to England to introduce his automatic telegraphic inventions.

Edison inventions came thick and fast now, and during the '70's he worked out more than one revolutionary invention, including his wonderful phonograph and incandescent lamp.

The phonograph worked at the first trial, and, imagine his workmen's stupefaction, when the machine repeated the words he had talked into it,

"Mary had a little lamb
Its fleeee was white as snow,"

and they recognized the boss's voice. He devoted ten more years, though, to improving it; once, it is said, going without sleep for five days and nights. Everything he invented was the result of innumerable experiments, for he was satisfied with nothing short of perfection.

After evolving his incandescent lamp, came, in 1882, one of his hardest tasks — establishing the first electric-lighting plant in New York City. At the end of this year only two hundred and twenty-five buildings in the city had been equipped! People were terribly afraid of the wires, and prejudice was hard to overcome. For a while, to get people started and accus-

tomed to the new illuminant, the current was offered *free* for three months. Before he had perfected his incandescent lamp, he said one day to some one who doubted his ability to bring it to a success:

“You wait, now. I’ll make electric light so cheap that only the wealthy can afford to buy candles.”

About this time he built his electric railway at Menlo Park, N. J., he being one of the first men in the world to foresee its possibilities.

Mr. Edison’s tenacity was only exceeded by his patience. For example, in seeking a substance suitable as a filament for his electric-light bulb, he experimented with no less than six thousand vegetable growths, finally, however, discarding all of them in favor of metal. It took nine thousand experiments — a thousand a year — to complete his great invention of the storage-battery.

Nothing short of absolute perfection satisfied him, and it is hard to see how any other inventor could ever improve upon anything coming, finished, from Mr. Edison’s laboratory. He himself, though, took hold of many other men’s ideas or inventions, and, crude though they might have been, made them into practicable, successful inventions.

In the United States alone he has been granted more than one thousand patents, beating all records.

He suffered a heavy blow when the discovery of rich iron mines in Michigan caused the abandonment of his big Jersey magnetic ore-milling plant. This swept away his whole fortune and put him heavily in debt. “I can at any time get a job at \$75 a month as telegraph operator,” he said cheerfully.

But his marvelously fertile brain came to his rescue, for he invented a method of making cement, and soon the Edison kilns were making half the Portland cement produced in America. Then he conceived the idea of "pouring cement houses"—making complete houses of cement in a mold, houses that could be transported anywhere and that of course were fireproof.

Many stories have been told as to how Mr. Edison came to invent the phonograph, his wonderful talking-machine, but the following is the only true explanation. Like most inventors, Mr. Edison has a wonderful memory and is extremely observant—always keeps his wits about him. In his early work with high-speed automatic telegraphs he had occasion to experiment with embossed strips of dashes and dots moving rapidly beneath a stylus to vibrate it, and which, he observed, produced *audible sounds*. From this trivial thing he got the inspiration, or idea, of the talking-machine, concluding that if the undulations on the strip could be given the proper form and arrangement, any desired sounds could be reproduced. How to produce the undulations was the problem—but almost immediately the idea came to Mr. Edison that they could be produced by the sounds themselves. This deduction completed his chain of reasoning, and the invention, the phonograph, was produced!

Mr. Edison has made so many inventions that he has been called the "great American patentee," and any attempt to enumerate his countless inventions would be useless. The following, however, he considers the greatest of his inventions:

Quadruple telegraph, incandescent light, phonograph, moving-pictures, telephone transmitter, electric storage battery, electric railway.

His first invention, by the way, was an electric vote recorder, with which, in Congress, a member could by pressing a button record his vote without losing any time or leaving his seat. He expected a grateful and enthusiastic reception when he arrived in Washington and explained the workings of his wonderful invention. But, to his chagrin, he found that some device to hamper and delay action by voting would be more welcome.

During the recent war, Mr. Edison was one of the very first among the Nation's greatest men to be picked out by our Government to help and advise them. He gave all his time to Uncle Sam, solving such problems as engines, batteries and torpedoes for submarines, wireless for warships, the aniline dye famine.

Mr. Edison was once asked what advice he could give to would-be inventors. He said in reply:

“The best advice I can give to a man who wants to be a successful inventor is to work twenty hours a day. That is what I did for thirty years, and I cannot see that it hurt me.”

Mr. Edison is one of the best examples of American grit, and to-day, at the age of seventy-three, he is America's Grand Old Man in the field of industrial-electrical invention.

His great-grandfather lived to the age of one hundred and four, his grandfather to the age of one hundred and two, but his father was only ninety-four when he died.

Mr. Edison attributes his own marvelous energy and capacity for hard work to simple living. Most of us eat too much, he says, and his own food consumption has been of the most frugal description. "I can't be bothered eating!" he has exclaimed when called to a meal, and it is well known of course that he has often gone for days without either food or sleep, when in the middle of an important experiment. He is one of the hardest workers that ever lived.

In practically all his inventions Mr. Edison has had the poor in mind. He has lighted their homes at nominal cost, brought the prima-donna and orator (with his phonograph) into the family circle, enabled poor people to live out of town, own fireproof portable houses, etc.

He is fond of books, and in the way of fiction likes detective stories, his brain being of the kind that naturally loves to work over and solve problems.

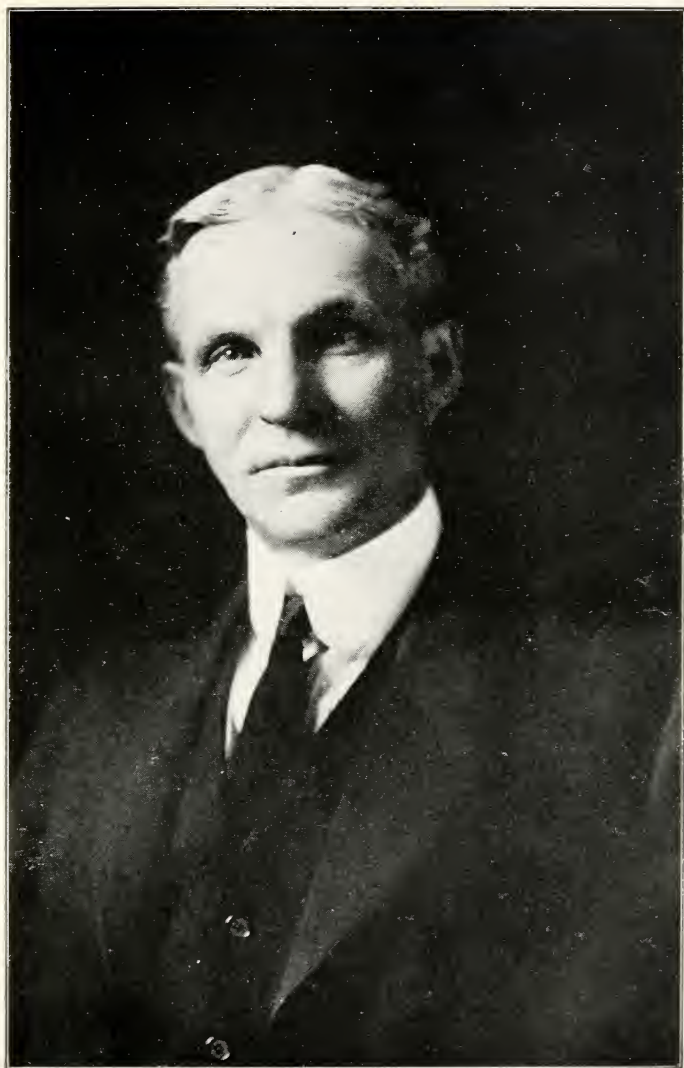
Not long ago Mr. Edison was asked if it wasn't a fact that opportunities for boys were fewer to-day than they were. He said in reply:

"I'd rather begin now as a poor boy than to start again in the conditions which surrounded my early life.

"The opportunities for a poor boy or a poor man are greater to-day than they were then; make no mistake about that."

HENRY FORD

**THE ALADDIN OF THE AUTOMOBILE
INDUSTRY**



HENRY FORD

HENRY FORD

THE ALADDIN OF THE AUTOMOBILE INDUSTRY

ON July 30, 1863, there was born on a farm at Dearborn, near Detroit, Michigan, a boy who was destined to make, within the miraculously short span of ten years, a fortune so huge that in all the world there is but one other man to-day with a larger one.

And in all the world but one other man ever made so much money so rapidly as did this Michigan boy, Henry Ford, once he got his automobile factory started.

A year or two ago his share of the profits of his business, for one year, amounted to about \$40,000,000, which means a daily income of more than \$100,000.

He once said: "I don't have to worry about banks — they have to worry about me. They have to sit up nights scraping together enough to pay me my interest."

What was the early career of this still young man who got so enormously wealthy in so short a time? Did he succeed through luck? How did he do it?

Henry Ford was born on his father's three-hundred-acre farm. He did not seem to be a bit different from other boys, except that he liked playing with tools, and making things with them out of odds and ends from

the junk pile. He once built an engine in this way.

As he grew older his fondness for mechanical things increased, and he made up his mind he was wasting time between the farm and school. So one morning he played "hookey," and walked all the way to Detroit — eight miles — to hunt a job. Almost immediately he got one at the Flower steam-engine works at \$2.50 a week.

As he had to pay \$3.50 a week for board, he thus faced a weekly deficit of \$1. So to come out even, he had to get night work. This was not so easy, but at last he succeeded in getting a jeweler to give him \$2 a week for four hours' work at night.

This meant a fifteen-hour day for Henry, as he had to work from seven A. M. to six P. M. and then from seven to eleven at night.

Such strenuous work turned the raw country youth into a very capable mechanic, and in course of time he began to use his brain, think and plan, and make suggestions, for he discovered inefficiency and labor-waste at the plant. His wages were raised to \$3.00, but he decided that he ought to learn something new, so went to the Dry Dock Engine Works at \$2.50. A knowledge of marine machinery manufacturing would, he figured, be worth the fifty cents a week. In a little while his wages were doubled, so he gave up his night work.

It soon became evident that young Ford, as well as being an unusually skilled mechanic, was in some way different from the other "boys" of the plant. Although he skylarked with them and took part in their

games, he had a restless, ambitious spirit, and was always hammering out some new idea or scheme for making a fortune. He quickly became a leader among the youths, many of whom were inspired by his earnestness and ambition.

One of his dreams at this time was to start a watch factory that would turn out two thousand watches a day costing thirty-seven cents each and selling for fifty cents. This he easily proved could be done by buying materials in great quantities, and manufacturing the watches with extreme rapidity.

But he was destined to make automobiles — not watches, for just about the time his fellow workmen were getting interested in his watch scheme, he had to go “back to the farm” and take care of it.

He now had a chance to read and study, and one day he came across an article in a technical magazine describing a horseless vehicle of French invention. At last! — This was just the sort of thing he had been vaguely dreaming of. It beat his watch scheme all to pieces!

So, with every sense alert, off he went to Detroit to buy materials with which to construct an engine that would beat the Frenchman's.

As he started to the depot in Detroit, on his way home, he met a fire-engine. He noticed its big boiler, and could not help thinking what a waste its weight and bulk caused. On getting home he began to experiment with an improved engine, and then came a great idea — “Why not use gasoline for the motive-power?”

Then he realized that he couldn't go any further un-

til he knew more about electricity. At that time he knew next to nothing about the mysterious fluid. So, to everybody's amazement, he abandoned the farm, and headed for Detroit again. Luck was in his way, for he at once got work at the Edison Light and Power Co.'s plant as night engineer at \$45.00 a month. It happened this way. There was a balky engine in one of their substations. The engineer in charge could do nothing with it, and it seemed a hopeless case. Ford came along at this moment.

"So you think you can tame this bucking-bronco engine, do you?" said the boss.

"Well, I'd like to have a try at it."

"All right!" replied the engineer, "go ahead!"

Ford took right hold of that cranky engine, and had it in perfect running order in less than no time.

Six months later he was transferred to the Edison headquarters as manager of the mechanical department at \$150.00 a month.

The young mechanic, who had but recently married, began to feel about this time that his fortune was made. He built a house for himself and wife, adding a large shed to it for a workshop — for he was determined to complete his gasoline engine in order to build a horseless carriage.

While he was experimenting he had to put up with much ridicule and suspicion as to his sanity.

"'Henny's' dotty!" said one; "he's crazy," said another.

But "Henny" just about this time, though he didn't know it, was carving his name deep on the pillar of

fame, and, in spite of the treatment he was getting from his neighbors, and his wife's urging that they go back to the farm, stuck heroically to his experimenting.

The last evening he tinkered on his engine he worked all night. All efforts of his wife to drag him from it failed. "In a minute," he kept saying. But the minutes ran into hours — and still he worked.

By morning, Henry Ford had completed his task — had manufactured a horseless vehicle. And no sooner had he put the finishing touches to it than he rode it down the avenue. After traveling very slowly for several blocks, it occurred to him that he couldn't turn. So getting off, he pulled and pushed, finally reversing it. Then he rode it back to his shed, tremendously elated with his success.

This first Ford car was a very crude, clumsy affair — a one-cylinder engine mounted on a buggy frame riding on four bicycle wheels refitted with strong tires. For a while Ford's "contraption" caused no little stir and amusement, but interest soon died out, and he realized that he'd have to think up many improvements before he could afford to throw up his position and start manufacturing motor-cars.

So for no less than eight years after this initial effort Henry Ford worked all day at his job, and then labored half of every night over the problem of improving his machine.

His perseverance was truly wonderful!

By this time automobiles were coming into general use, but they were expensive, luxurious vehicles within reach only of the rich. Ford's idea was the same idea

he had evolved as to watches while a youth with the Dry Dock Company — to make a cheap vehicle in such large quantities as to enable people of small means to own one. So, steadily persevering, he at last devised a two-cylinder engine that worked to perfection, built a real body for it, and rode about in it extensively so as to advertise it, for he wanted to interest capital, form a company, and start automobile building. He foresaw an enormous demand — and enormous money-making possibilities. Capitalists were timid, however, and he could find no one willing to risk any money in such a venture.

“When a feller needs a friend,” he usually finds him among the lowly, seldom or never among the rich and powerful. This was the case with Ford in his dark hour. He knew a man styled “Coffee Jim,” who ran a lunch wagon. He had faith in Ford, and put up enough money to enable him to give up his job at the Edison plant and build a car to compete in the automobile races.

Alexander Winton, one of the contestants, had beaten everybody up to date with his car, and when Ford’s little two-cylinder car loomed up at the races there was a general laugh. Gloom settled down upon the Wintonites, however, for, amid cheers, the Ford car took the lead, spinning around and around the track and finishing first.

Ford and his car got a lot of valuable publicity out of the race, and capitalists a-plenty came around, but as they one and all stipulated for control no Ford factory was built just then. Ford, though an inventor, was too

shrewd to let anybody else grab control of his idea.

About this time James Couzens, a shrewd merchant of Detroit, Tom Cooper, a champion bicycle rider, and a few other men of modest means became interested in Ford and his car, and with capital they furnished, Ford built a four-cylinder monster of eighty horse-power. Barney Oldfield was engaged to drive it, and in a three-mile race he won by half a mile!

The feat startled the world, and fortune now seemed to smile on the poor mechanic. Offers of capital poured in, and a company was formed of which Ford became vice-president, general manager, etc., at \$150 a month. But a quarrel arose at the outset. His backers wanted to manufacture high-priced cars selling for thousands of dollars, and Ford was determined to stick to his original intention for making cheap cars for the masses. As a result of the clash Ford, now more than thirty years old, and with a wife and a child to support, found himself without money or job.

Two men, however, Couzens and Wills, sided with Ford and put up some money. A large shed was rented, a couple of workmen hired, and enough material purchased to build a few low-priced cars. Their company was capitalized at \$100,000, but only about \$28,000 cash was paid in.

Ford now saw that his opportunity had come, and he worked like a Trojan day and night, his two mechanics also. His customers increased rapidly, many of them paying substantial sums in advance, and soon the Ford shop was employing forty men and ordering material in carload quantities. Every cent he made

he put back into the business, and his sales were at the rate of one thousand cars a year. The price of his car then was \$900.

Then winter began, a time when orders were scarce, and consequently money. So Ford made up his mind to build a four-cylinder car that would beat the world's record — and it did!

Now it was almost Christmas — and there wasn't a cent in the treasury to pay his one hundred workmen with. It was an awful crisis for Ford. A dishonest, tricky, shifty man would have lied to his men and jollied them along, promising them all sorts of impossible things. But Ford was not that kind of man. He was an honest man, as well as practical idealist, and he was shrewd and far-seeing.

He told his workmen frankly, truthfully, what the exact conditions and prospects were, and to a man they agreed to stand by him. This was the red-letter day in Henry Ford's career. Cars tumbled out of his shop faster than ever, and before long success came with a rush — so fast as to be dizzying.

In 1914 he put into effect his minimum wage of \$5 a day (it is now \$7), and reduced the working hours to eight a day. This led to an invasion of Detroit by job-seekers that was seriously embarrassing for awhile.

Mr. Ford displayed marvelous wisdom and knowledge of human nature in raising his workmen's pay and reducing their work hours, though employers almost the world over called him "dreamer," even "fool." For in one month, February, 1914, under the new eight-hour plan less than sixteen thousand men made ten thousand

more cars than fully sixteen thousand men did the previous February working ten hours a day. Maybe his new plan didn't pay!

Right on top of this revolutionary proceeding Mr. Ford instituted a profit-sharing plan, and after being in operation five months the bank accounts of employees benefiting by it showed an average increase of three-fold, the value of their homes increasing ninety per cent. as well.

Then he began to divide profits with his customers, by reducing the price of his cars.

Mr. Ford to-day has six men in his employ each getting a salary of \$75,000 a year, a number at \$50,000, and many thousands who are getting from \$7 a day up. All have a "chance upward."

Mr. Ford keeps enormous sums on deposit in various banks, and is one of but very few men in the world who can draw a check for five or ten millions. Enormously wealthy as he is, however, he makes no investments outside his own business.

"I have never sought fame nor dollars," he once said. "I have never tried to save money and do not believe in young people saving money. Youth should spend its resources in carrying out its ideas, in education, in character formation. . . . My money comes in fast — and it goes out fast into new forms of industries germane to my own business."

In line with this wise policy Mr. Ford, less than a year ago, put \$7,000,000 into a tractor factory which will employ four thousand workmen and turn out two hundred and ten tractors a day.

His solution of the labor problem is the sharing of his profits — not annually, but *weekly* — with his employees. He holds that if given in a lump sum at the end of the year it is almost certain to be lost in a bad investment. By figuring the profit — and paying it — weekly, the workman will live better, dress better, spend more money on his home and family, and soon own a house.

“I began,” he says, “by having the desire to build a motor-car that would be within the means of the many, that would stand up and be worth while. I succeeded, and have sold more than three million of them.”

It was this idea, together with his liberal treatment of his employees — his willingness to share his profits and prosperity with his workmen — that made Henry Ford the world's greatest leader of industry, and, for his age, the world's wealthiest man.

Mr. Ford is only fifty-six, and as wiry and active as ever. He is of medium height, slightly built, has keen humorous eyes, and abundant gray hair. His clean-shaven, very mobile face is like an actor's, and he is very magnetic, and filled with a tremendous enthusiasm that is contagious. He manifests an intense interest in everything, and likes to discuss and analyze — find out the why and wherefore of things.

Like most geniuses, mechanical and otherwise, Henry Ford is indifferent to and careless with money. While in his private workshop at his plant one day he was handed a check for \$200,000 by one of the officials. A month passed and to the surprise of his office the check had not come back! Obviously it had not been de-

posited anywhere. Mr. Ford was asked about it, and for awhile had no recollection of it. Bewilderment set in.

“Hold on, wait a minute!” suddenly cried Mr. Ford, who was beginning to remember.

And diving down into a pocket of his greasy overalls he produced a much soiled and twisted up scrap of paper. It was the check, which, in his intense absorption, he had thrust into his pocket and clean forgotten about.

Mr. Ford is intensely democratic, loves his fellow man, and is filled with the spirit of helpfulness. As one of his townsmen once said:

“If you get stuck in a rut with a tin Lizzie, and ‘Henny’ comes along in another, he’ll stop and pull you out — if he can. And mostly he can!”

Mr. Ford’s only son, Edsel, refused a chance to go to college, preferring to follow in his father’s footsteps and go to work in the plant. He is now familiar with every department of the immense plant, and can be seen any day hard at work at a desk in his father’s office in Detroit. Edsel is a chip of the old block — a shrewd, hardworking youngster amply able to make a living for himself.

Mr. Ford sold his Detroit home, and now makes his residence on his two-thousand-acre farm on Rouge River, near his old home, Dearborn. His winter home is at Altadena, California. He is a nature-lover, fond of birds and flowers. At an expense of \$4,000 he once imported five hundred rare birds from England. The very night of the day his feather pets arrived at his

Rouge River farm — he freed them all. They looked homesick, he explained, and he couldn't sleep thinking of them huddled up, lonesome-like in their cages.

He is fond of boys, too, for he was once a poor hard-working boy himself. Every year he takes a dozen or more boys from the Detroit streets, keeps them at school in winter, and lets them work on the farm in summer. He feeds and houses them all the year round and employs a man specially to look after them. If they're good boys, work hard — make good — there's a bright future in store for them.

Some of Mr. Ford's sayings, and recipes for success, are interesting and valuable.

“ Ideas are the great forces in the world.”

“ Do not bother about money-making, but put all your effort into putting over your idea. If you do that the money will inundate you. That's the secret of success, I'm inclined to believe.”

“ The only way to save money is to go ahead and make so much that you have the hardest kind of work in spending it all.”

“ I spend no more on myself than any man in my employ. Money to me merely means a way to do something more.”

“ Decrease prices, raise wages in proportion as business grows.”

“ The world is rapidly coming to the partnership (between employer and employee) idea.”

“ Nothing that does not pay is of any good,— my paper (*The Dearborn Independent*), for instance; if I cannot make it pay it will serve no purpose.”

“No man who fastens his eyes on fame or the dollar ever arrives anywhere.”

“It’s good business sense to divide with your employees.”

Mr. Ford never reads “boosts” on himself. His secretaries put them in the furnace. But he likes to read “knocks.” These all reach him. He profits by them; so he says:

“A wife helps a man more than any one else — she criticizes him more!”

CHARLES GOODYEAR
INVENTOR OF VULCANIZED RUBBER



CHARLES GOODYEAR

THE NEW YORK
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TILDEN FOUNDATIONS

CHARLES GOODYEAR

INVENTOR OF VULCANIZED RUBBER.

A SLIGHT mischance or trivial accident has often resulted in a great invention or discovery. Sir Isaac Newton, the English philosopher and mathematician, was asleep under an apple-tree when a ripe apple dropped upon his forehead, wakening him. This led to his great discovery of the law of gravitation. The boy Stephenson, watching his mother's kettle on the fire, was startled when he saw the lid suddenly rise, letting out a puff of steam and then as suddenly fall, only to rise and fall again a moment later, the operation getting more and more frequent as the boiling water emitted more and more steam, until finally the lid was lifted off the kettle altogether. This seemingly trivial incident gave the lad the wonderful idea of harnessing steam — and he invented the steam engine which revolutionized industry and travel by land and sea.

One cold spring day, Mr. Goodyear was standing before a stove in a store at Woburn, Massachusetts, explaining to some skeptical acquaintances the properties of a piece of his sulphur-cured india-rubber which he was holding between his fingers, when he accidentally dropped it on the almost red-hot stove. He naturally expected it to be burned, or at any rate melted, but,

to his surprise, it was only shriveled and hardened, not softened.

This little accident would have meant nothing to most men, but to Goodyear, his senses and wits sharpened by penury and want, it was in the nature of a revelation. He continued his experiments with india-rubber with the utmost ardor, for he had made the discovery that rubber, when mixed with sulphur and subjected to intense heat, would become permanently hard — would not soften or melt. In other words, the art of vulcanizing rubber was almost within his grasp, his only remaining difficulty being to ascertain the exact degree of heat and the exact space of time to apply it.

India-rubber at this time was more or less of a curiosity, or toy. Chunks, or balls, of the curious substance were given to children to play with, because of its resiliency, or elasticity. When thrown to the ground or against a wall the rubber would bound back, high in the air many times, before "going dead" on the ground. It was the delight of boys and girls. Goodyear's accident with a piece of his prepared rubber led to its eventual world-wide use, in myriad ways, in commerce.

Charles Goodyear, whose invention has proved an incalculable benefit to humanity, was one of the most unfortunate of our great inventors, and, though successful in perfecting his invention, died in debt. Charles, the son of Amasa Goodyear, who was the first man to make hay-forks of spring steel instead of wrought iron, was born at New Haven, Conn., on De-

ember 29, 1800. He attended the public schools of New Haven, and spent most of his early youth on his father's farm, or in his factory. He was a great reader, being especially fond of the Bible and other religious works. While doing odd jobs around the farm his inventive talent came to the surface and he made improvements in first one thing and then another. On coming of age, his father, then in business in Philadelphia, took him into the firm. The business of A. Goodyear & Sons was quite prosperous until 1830, when panicky times came, and the firm had to suspend.

It was at this period that a rubber boom started. Large quantities of the crude article were imported into the United States, india-rubber factories sprang up and many companies were organized for its manufacture into shoes and coats. But the manufactured product was very unsatisfactory. The shoes and coats made in winter, softened and disintegrated in summer. And severe cold froze them stiff.

Some friends, it is said, presented Daniel Webster, the famous statesman and orator, with one of these new-fangled india-rubber coats and hats, in the early days of their manufacture. One cold morning he went out onto the piazza of his residence wearing them. They froze as hard as iron, so, releasing himself from his rigid coat, which stood on the porch where he left it, and putting the hat on top of it, he went inside. Friends passing by bowed to the stiff figure, believing it to be the great Daniel Webster.

India-rubber was known for a hundred years or more before Goodyear's day. French scientists had discov-

ered in Peru, in 1735, a singular tree whose bark when pierced yielded a milky gum. This sap was collected in clay vessels and, when dried in the sun, became hard. This hard material was caoutchouc — or crude rubber, and for a long time was nothing but a curiosity. In England small pieces of this crude rubber were for quite a time sold at a high price as curiosities, coming in time, however, to be used for erasing pencil marks. Then about 1830 Mackintosh, an English manufacturer, used it in his famous waterproof coats, inserting a thin layer between two pieces of cloth. Mackintoshes, as these rubbery garments were called, soon became all the rage for wear in rainy weather.

It was in 1834 that Charles Goodyear turned his attention to india-rubber, and until he died his mind was wholly absorbed with the idea of manufacturing from the substance a solid elastic material. Practically the first object of rubber that came to his attention was a life-preserver, for which he almost immediately invented a valve device, rushing to New York with it to see the Roxbury Company. The rubber fever was at its height then, resembling a gold or oil craze, and Goodyear was sanguine of selling his invention. He was soon enlightened as to the real condition of affairs in the india-rubber industry, and was urged to devote his time to discovering some method of bestowing durability to india-rubber goods.

This was soon after the failure of A. Goodyear & Sons, and Charles, on his return to Philadelphia, was arrested and jailed for debt. For a while the young inventor was compelled to carry on his work and experi-

ments in prison. Later he continued his experiments, though often in the direst distress, in New York and Massachusetts. His courage and persistence were truly wonderful, and he never lost hope. Whenever he got a few dollars, they were immediately invested in new materials, and, with fresh courage and energy, he would go on experimenting.

About 1835 he got his first encouragement when, after countless trials, he discovered that by boiling the gum (rubber) with magnesia in quicklime and water a substance resulted that seemed to be what was wanted. He got a patent and began to sell his product.

A year later came, by accident, another important discovery. After bronzing some india-rubber cloth, he applied some aqua fortis to remove some of the bronze, but, as it seemed to have destroyed the cloth, he threw it aside. A week later, on picking up the supposed spoiled piece of cloth, he saw that it had undergone quite a change. The acid had hardened it to such a degree that heat would no longer melt it. Then he considered that as the aqua fortis contained sulphuric acid, it was this latter that had "cured," or vulcanized, his india-rubber cloth.

The secret he had been seeking to discover, lo, these many days, was now his!

He soon found a partner with money and together they leased an abandoned rubber factory on Staten Island, N. Y., and also opened a store on Broadway, New York City.

Everything went splendidly for a year or two, when

the panic of 1837 ruined his partner, and again Goodyear was penniless. Everywhere he went to raise fresh capital he was ridiculed, and people began to call him the "India-rubber maniac."

So, failing of success in New York, Goodyear settled in Roxbury, Mass., where he succeeded in getting E. M. Chaffee to put the plant of the Roxbury Rubber Company at his disposal. Again for a while he was prosperous — and then again he was penniless. But his confidence in himself and faith in his product led him to persevere, and on and on he went, starving and struggling, even selling his children's school-books in order to buy food or materials. He used to bake his rubber compounds in his wife's oven, and sometimes beg the use of ovens at the shops in Woburn after hours. The workmen thought him crazy.

Then one day came another important discovery. He saw one of his employees, Hayward, sprinkling the rubber with sulphur and drying it in the sun. Sulphur had the same effect, he noted, as nitric acid, "cured" it just as well, and he found that heat, applied to the sulphured article, caused it to become pliant in cold weather, retain its wonderful elasticity at all times, and to lose much of its disagreeable odor. Hayward used to say that the process was revealed to him in a dream.

This discovery came in 1839, but with it came greater hardships than ever. For a long time he was forced to live on charity. In one crisis, half starving, in mid-winter, he trudged many miles through the snow seeking aid. He stumbled in the snow over and over again,

nearly succumbing to the cold. Finally he reached the home of his acquaintance, Mr. Coolidge, who generously gave him enough money to keep himself and family all winter.

After undergoing almost incredible sufferings, the darkest hour of his life being the day when his child died from lack of the commonest necessities of life, he at last enlisted the aid of his brother-in-law, William DeForrest, and, in 1844, obtained his patent for vulcanized rubber.

While in Washington getting the patent he secured an interview with President Andrew Jackson, showing him some specimens of his manufactured rubber. The President gave him a letter over his own signature commending them.

Goodyear received his most substantial help, though, from the Rider Brothers of New York, both men of considerable property and of keen intelligence. They furnished a large sum of money to manufacture the Goodyear articles. Goodyear secured altogether about sixty patents, and at the World's Fair in London in 1851 the Great Council Medal was conferred upon him, and in Paris in 1855 he won the grand prize, also receiving from the hands of Napoleon III the Cross of the Legion of Honor.

Though a prey to necessity up to the day of his death, he lived to see his invention applied to fully five hundred uses, and a huge army of people busy manufacturing "Goodyear rubber goods."

His invention conferred many benefits upon humanity, for multifarious are the uses to which it has

been made available. In our Civil War its great value was, for the first time, fully realized.

Goodyear had the sublime faith and stick-to-it-iveness of the true inventor. Once he got his idea, he stuck to it, worked and worked, experimented and experimented, to the last ditch. His tenacity was truly wonderful. It equaled that of the potter, Palissy, who used all the furniture in his humble home and part of the house itself as fuel in his furnace to obtain the requisite heat to perfect his enamel ware.

To-day, thanks to Goodyear, the rubber industry has grown to stupendous proportions and his name is a household word. American automobilists alone are spending now a billion dollars a year for rubber tires, and the uses of rubber in countless other ways, especially in humanitarian purposes, are world wide.

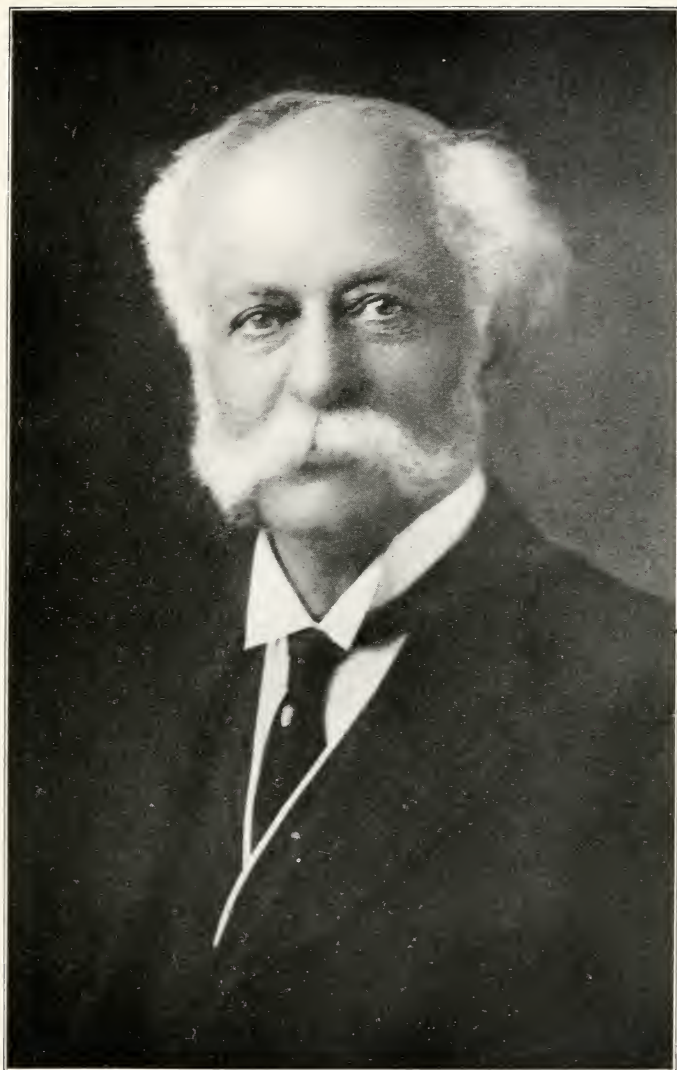
Like wood, steel or copper, rubber has become a staple.

Had Goodyear lived to see the outbreak of the world-war his wealth would have been fabulous. As it was he died in debt, but *not*

“Unwept, unhonored, and unsung.”

HENRY JOHN HEINZ

**PITTSBURGH PICKLE KING AND
SUNDAY-SCHOOL LEADER**



HENRY JOHN HEINZ

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PITTSBURGH PICKLE KING AND SUNDAY-SCHOOL LEADER

AN inspiring and really wonderful romance of business is the story of Henry John Heinz, the Pittsburgh boy who built up the largest pickling and preserving corporation in the world, entirely through his own efforts and initiative. He did it, too, in a very few years, and to-day his name is a familiar one the world over.

Henry's father came from Bavaria to Pittsburgh in 1840, and it was in the Smoky City that the boy was born in October, 1844. His parents, in 1850, removed to Sharpsburg, where his father continued his business of brick-making, later becoming a building contractor in addition.

The boy from an early age showed unusual intelligence, so his education and upbringing were given much thought and care by his parents, who were very fond of him. When he was old enough, he used to spend some of his time at the kilns, helping his father; or, when he was not at school or studying his lessons at home, his parents would let him assist in the cultivation of a garden that was a part of their four-acre home plot. This work was very much to the boy's liking, and he loved to potter about the vegetable patches and flower-beds "watching things grow." It was while

at work in this famous garden that the seeds of ideas were implanted in his mind that later on he seized upon and developed into what proved a veritable gold mine.

The boy had more than an average share of his European wine-making ancestors' shrewdness and thriftiness, and it soon dawned upon him that, as the garden produced more than the family could eat, he could perhaps sell the surplus and make some money for his father and also himself. To his own and his parents' surprise he had great success selling the garden-truck at market to the villagers, and one summer, before he was seventeen, sold as much as \$2,400 worth.

His success was so marked, and he developed such extraordinary business gumption — good horse sense — that his parents, who had about decided to make a minister of him, sent him instead to a business college, for, thought they, he surely is intended for a business man.

Here Henry studied business forms and usages, and learned a lot about commercial accounting. Later he became his father's bookkeeper and practical assistant. He almost immediately showed himself a resourceful, go-ahead young man by introducing into his father's brickyards new methods by which they could be run in winter as well as summer. His father was so pleased that he gave him a partnership.

His ambition was too large, however, to be bounded by such a small business, and, with his father's consent, he later on withdrew from the firm to form a partnership in the brick business at Beaver Falls.

But still he was not satisfied. Ever since his boyhood days, when he had been so successful in selling garden produce, he had been nursing an idea — the idea of pickling, or otherwise preserving, vegetables. In those days this business was in its infancy in America, nearly all packed or preserved foods being imported from Europe. They were therefore expensive, and in the nature of luxuries. He foresaw a good demand and large sale for a home product, so, with L. C. Noble, he started a packing and preserving plant in one room of a small two-story building at Sharpsburg, Pa.

For a year young Heinz gave his attention solely to horseradish, which he dressed in a new way and packed in bottles. He procured the horseradish from the family garden, using in a year as much as filled three quarters of an acre. With a basket of his prepared horseradish in bottles he would go out, day after day, and peddle it. Soon, as he added pickles, sauces and other foods to his product, he had to use a wheelbarrow. Finally the variety of his pickles and preserved products grew so large that he had to buy a horse and cart. Jams and jellies were added to the Heinz product, and his “pork and beans” gained for him a big reputation.

In the meantime the firm was increased by one more partner, E. J. Noble, and then the business was removed to Pittsburgh, where a large four-story building was leased. For three years the business under the three partners went along very prosperously, but in 1875 the Nobles retired from the firm, and Henry Heinz’s brother, John H., and his cousin, Frederick, bought an interest. In 1882 a vinegar plant was es-

tablished, and in 1905 the business, now grown to enormous size, was turned into a corporation with Henry John Heinz, founder of the business, president.

To-day the Heinz business is doubtless the largest of its kind in the world!

In addition to the large plant at Pittsburgh with its four thousand employees, there are sixteen branch factories (including one in England, one in Canada and one in Spain), ninety-eight salting houses, forty-five distributing centers, four hundred traveling salesmen, and agencies everywhere in the world. And it takes about forty thousand people to harvest the annual product, of the company's forty thousand acres of land.

The little four-acre garden grew to a forty-thousand-acre one!

Thus we see how the praiseworthy desire of a boy to help his parents by preparing and selling table delicacies from the family garden and thereby turning an honest penny led to the building up of a colossal world-wide business and, of course, a big fortune.

It took grit and gumption — and Henry Heinz had both. He stuck to his idea through thick and thin.

Much of the Pickle King's success, from the time he first began to pickle and preserve anything, was due to his insistence upon cleanliness in his factory, and everywhere.

His original idea, which has never been deviated from, was to give the public the earth's choicest products, so prepared and packed as to offer, at a fair, reasonable price, the highest possible degree of quality, purity and cleanliness.

To attain this end Mr. Heinz inaugurated a program that only a great captain of industry could have successfully developed and brought to perfection.

The result was one of the largest and most efficient industrial businesses in the world — a model plant to which fifty thousand visitors from all parts of the world find their way annually. His policy successfully carried out, led him ahead of less careful competitors, the public rapidly coming to have confidence in his packing. So the business grew very fast, once the Heinz standard of high quality was known.

Mr. Henry John Heinz, who was carried away in May, 1919, by pneumonia, lived a life of great usefulness and was recognized as one of the country's foremost manufacturers and business men. He enjoyed equal prominence in church and Y. M. C. A. work, and as a broad-minded philanthropist.

He took unusual care of his employees, providing for them a lecture hall, library, bathrooms, lunch-rooms, roof garden and wholesome amusements — vaudeville and minstrel shows. The galleries of his employees' hall he filled with costly historical and other paintings which he procured from all parts of the world. He believed in travel, of the kind that was instructive, and he himself made many trips abroad, and some extensive tours in Palestine, Egypt, Mexico, Bermuda, the West Indies. Everywhere he went he kept his eyes open for curios and works of art, to add to his wonderful collection.

Though he bought many art treasures in foreign lands, he was a thorough American, as an artist once

found out. While Mr. Heinz was abroad the artist painted some portraits in a frieze of the library he was decorating for the wealthy pickle manufacturer.

"Whose portraits are they?" inquired Mr. Heinz when he saw them.

"Michelangelo, Savonarola, Molière . . ."

"There stop," said Mr. Heinz with his usual kind voice and smile. "I am an American in every fiber of my body and in every heartbeat. These were very eminent gentlemen, but they never knew America. Scrape them out and insert a few Americans of the type of Franklin, Longfellow, Whittier, Lincoln, Emerson — our own poets and statesmen. This must be an American room so far as those portraits are concerned."

He kept in very close touch with his employees, doing much to help encourage them, for one of his successful ideas was that a business must be run by heart power. So he treated his help fairly, helping those deserving it over rough places, and as fast as employees displayed the right kind of ability and sufficient of it — he took them into the firm — made them his partners. There never was a strike at the Heinz works.

Mr. Heinz was a liberal and wise giver in charitable matters. One of his favorite maxims was: "Make all you can honestly, save all you can prudently, give all you can wisely."

His philanthropies were many and varied, extending as far as Japan, China and Korea, which Far Eastern lands he once visited as chairman of a Sunday School Commission. In 1906 he succeeded John Wana-

maker as president of the Pennsylvania Sabbath School Association, and he was also chairman of the executive committee of the World's Sabbath School Association, with its 36,000,000 members.

One of his sons, Howard, while at Yale University became greatly interested in boys' club work, and on his return home wanted to establish himself in this kind of work for boys and girls on a large scale.

Howard's father became much interested in his work, at last deciding to erect, at his own expense, a special building, with modern equipment, for use in carrying on this work.

Up to the time of his death he took the keenest interest in Sunday School and other church work, and also, like Mr. Rockefeller, gave away much money for educational purposes — the building up or founding of schools and universities.

CYRUS HALL McCORMICK
INVENTOR OF THE REAPING MACHINE



CYRUS HALL MCCORMICK

CYRUS HALL McCORMICK

INVENTOR OF THE REAPING MACHINE

IT seems strange that anything so common and so necessary as an agricultural implement should remain unimproved, absolutely unchanged, through several thousand years. Yet, until Robert McCormick and his son Cyrus bent their minds to improving it, the sickle (reaper) was the same rude implement as that used by our remotest ancestors. It was the same hand instrument as was used by the Egyptians along the banks of the Nile and by the Babylonians and still more ancient races in the valley of the river Euphrates, which flowed through the Garden of Eden.

Necessity, however, is the mother of invention, and, for the reason that the boy Cyrus McCormick found it terrible drudgery, the hand sickle was superseded by the reaping machine, and another revolutionary invention placed to the credit of American pluck and ingenuity.

Cyrus McCormick, who invented the reaper, was born on February 15, 1809, on the paternal farm in Rockbridge County, Virginia, in a period of hard times and Indian and other wars. Robert, his father, was Scotch-Irish, that strain which is conceded to be the backbone of American democracy. He was an edu-

cated man, and though his homestead was built of logs, it was commodious and well furnished, with parlor, mahogany furniture, carpets and books.

Robert McCormick was a man of property and high-standing and ranked with some of the most prominent gentleman-farmers of his State — men like Washington, Jefferson, Webster and Clay. His farms covered one thousand eight hundred acres, and included grist mills, sawmills, smelting furnace, distillery and blacksmith's shop.

This was in the days of Tecumseh, whose Shawnee braves were terrorizing the settlers, the days when the vast prairies of our Western country were roamed by buffalo, when Chicago was unknown and New York City about the size of Mobile, Alabama. The West was a vast unfarmed stretch of wilderness, and what little farming was done was done with primitive wooden tools — the wooden plow, the sickle, scythe and flail.

After 1812, however, there was a large and increasing immigration into America of some of the best blood and brain of Great Britain, and a great demand for farmland set in.

It was in such times as these, when our Republic was still very young, that the boy Cyrus McCormick lived. When he could he attended school, but for the most part he worked on his father's farm, or cut wood and weeded the garden before his breakfast. The Bible and catechism, Murray's English Grammar, Webster's Spelling Book and Dilworth's Arithmetic were practically the only books he studied in school.

Cyrus was a very serious boy, and had the faculty

of concentration. He could stick to a task and let nothing interrupt him until he had finished it. He was a thinker and planner, and always intent upon something or other. When about fourteen, for example, he felt the need of a map of the world. He planned and drew one with great skill.

When he was fifteen, being a sturdy, strong-limbed youth, he started out one day to do some reaping — a man's job, if ever there was one. For hours, the perspiration rolling down his face, he stood amid the ripe wheat swinging the clumsy implement that cut it. At last body and brain rebelled against the drudgery, and flinging down his sickle he was soon absorbed in thought. How to make his job easier was his problem. Not that he was in the least degree indolent. He was a regular dynamo of energy, and there wasn't a lazy drop of blood in his body. But he had a wonderful brain, the mind of an inventor, and he intuitively felt that there was a "better way" of reaping grain — could he only discover it. He saw that if he were to continue this work he would need a lighter, handier implement, one that could be swung to and fro easily.

After considerable thinking and planning he set to work and most laboriously whittled out a smaller cradle. He was then able to do more and better work with less effort with his invention. A second invention of his was a hillside plow. Later on he improved this into a self-sharpening horizontal plow.

"Cyrus," said a man who knew him, "was a natural mechanical genius. He was always trying to invent something."

There was a little log workshop near the McCormick homestead, and here Robert and his sons used to work and experiment on rainy days.

When Cyrus was eighteen, he followed in the footsteps of George Washington and studied surveying. The quadrant he made for his own use is still preserved. By the time he was of age Cyrus was a tall, muscular and quite handsome young man, grave, dignified, and always absorbed in thought or business.

Though he attended church regularly and sang in the choir, and doubtless was acquainted with many girls, he didn't at this period devote any time to "society." As he explains, in a letter to a cousin in 1831:

"Mr. Hart has two fine daughters, right pretty, very smart, and as rich probably as you would wish; but, alas! I have other business to attend to!"

Cyrus little knew when he wrote this letter that this "other business" would some day bring into being a plant in Chicago, covering two hundred and twenty-five acres!

Cyrus' father, long before he was born, had realized that the hand sickle was clumsy and imposed needless drudgery, and it had been the dream of his life, his one consuming ambition, to invent a Reaper — a harvesting machine.

His first attempt, which was tested in the harvest of 1816, was a failure. By 1831 he had improved it — but again it was a failure. So, after fifteen years of experimenting, he gave it up as a hopeless job.

Cyrus, now twenty-two, full of energy and enthusiasm, seized upon the reaper his father had attempted

to invent, and, with characteristic intentness, began experimenting himself.

His extraordinary mechanical genius enabled him to triumph over every obstacle. Taking hold of the crude machine his father had constructed and that wouldn't work, the first thing the youth did was to invent the "reciprocating blade"—a straight blade with back and forward motions of its own—a blade with two motions. Another problem he solved was the supporting of the grain while it was being cut. In that same year, 1831, he finished his task, and one day in July he gave a successful test-exhibition of his reaper. A few days later he cut six acres of oats with it.

The next year he gave a public exhibition of his reaper at Lexington, encountering, however, a great deal of opposition and ridicule, for the laborers saw no work for them if it came into general use. Seeing the young man's plight, one of the spectators, a member of the State Legislation, the Hon. William Taylor, who owned the adjoining farm, said:

"Young man, I'll give you a chance on *my* farm. Just pull that fence down there and go in."

Mr. Taylor was a broad-minded, progressive man, and had some confidence in the invention. Besides, he liked the young man's looks and admired his pluck.

The test was a success, and Mr. Taylor pronounced the McCormick Reaper invention worth \$100,000.

Cyrus' father was greatly pleased, and said: "It makes me feel proud to have a son do what I could not do."

Cyrus now began the business of manufacturing his

reaping machine, offering them at \$50 apiece; but, such was the prejudice, that it was nine years before he could find a farmer with courage enough to buy one. Meanwhile he had to work his farm, and then some iron mines on his land, to keep going. A panicky time came along, however, and he became bankrupt. His creditors swept everything away save his reaper, which, being the work of a "crazy man" was not deemed worth carting away!

Cyrus did not lose courage on account of this his first failure, but went ahead giving exhibitions of the machine. For a long time, though, nobody would buy one, and, up to 1839, he hadn't sold a single one. At last Fortune smiled. One day Abraham Smith, a farmer living some distance away, mustered up courage to buy one. All went well for a few days — the machine worked beautifully and Farmer Smith was more than pleased.

Then it rained, and for the first time it was discovered that the McCormick Reaper wouldn't cut wet grain! So Cyrus had to take the machine back, and go on experimenting. His reaper was not yet perfect.

Many men would have given up the problem — would have thrown the machine onto the junk pile. But Cyrus McCormick was not that kind of man. He had too much faith and determination. After much thought he got the idea of giving his blade a serrated edge, that is, of nicking it like a saw. On trying his new blade it worked to perfection — and the problem of a successful reaper was at last solved!

Fixing the price of his reaper at \$100, he now

started out to be his own salesman. It was mighty hard work, for he had to give endless demonstrations with his fantastic-looking invention, and do a lot of talking and traveling. In one year he had sold only seven; the next year, 1843, he disposed of twenty-nine, in 1844 selling fifty.

But he began to experience an unlooked-for difficulty. Some customers for his reaper lived so far away, in the West or Southwest, that he was unable to get his machine to them in time for the harvest. At last one of his friends said to him:

“Why don't you go out West where there's lots of room and where you can get land for your factory cheap?”

Cyrus thought well of the suggestion, but, with his usual caution and thoroughness, studied the map long and hard before making up his mind. Then, with only \$300 in his pocket, he started out on a three-thousand-mile trip, traversing a number of Western states, at last locating, in the Spring of 1847, in the then new town of Chicago, once Fort Dearborn.

Here he succeeded in inducing one of the town's foremost citizens, William Butler Ogden, to put in \$25,000 and become his partner. A favorable site was selected, a factory built, and before long the McCormick Reaper Company was in full blast. The price of the machine was now set at \$120.

Ogden and McCormick were almost giants physically, and attracted universal attention as they walked down the street together. They were both fine-looking, very tall, muscular, dominating men, and, wearing their big,

wide-awake felt hats, presented a striking appearance.

In 1849, however, McCormick quarreled with Ogden, who was as strong-minded and stubborn as himself, so offered Ogden his \$25,000 back, plus \$25,000 — \$50,000 in all. Mr. Ogden accepted the offer and pulled out of the firm.

Young McCormick's decision to move West was the result of deep thought and study, and his choice of Chicago as a site for his manufactory, a singularly wise and lucky one. Chicago then had a population of only ten thousand, but it was fast becoming a great trade point by reason of its location. The country all around was opening up to settlers from the Eastern states and from Europe, and the McCormick Reaper was aiding farmers in their conquest of the prairies to an enormous extent.

Soon after buying out Mr. Ogden, McCormick began to plan and develop his business with consummate skill and customary thoroughness. He gave written guarantees with his machines; sold them at a fixed price which he publicly advertised; advertised extensively in the newspaper — for he was a great believer in publicity — appointed agents throughout the section, and, by a system of fair dealing, established a reputation for such, thereby retaining the good-will of his customers. Thus he borrowed money from the bank to manufacture reapers, which he sold "on credit" to the farmer, seldom losing any money, though he often had to wait a long time. He trusted the farmer, and so earned his gratitude and good-will.

His most spectacular advertising methods were in the

way of public tests — field contests with rival reapers. In course of time these competitions became so tremendously exciting, rough and expensive that by common consent the various manufacturers abandoned this kind of business warfare.

By 1850 there were three thousand McCormick reapers in the wheat fields of America, and the next year, Mr. McCormick exhibited his machine in England at the Crystal Palace Exhibition, winning the first prize and also the County medal. In 1855 he went to Paris, where he won a gold medal and succeeded in selling one of his reapers to the Emperor, Napoleon III. In 1862 he made his headquarters in London, from which center he conducted a vigorous selling campaign throughout Great Britain and on the Continent.

By this time the McCormick Reaper Works, Chicago's first manufactory, were producing more than six thousand reapers a year. By 1871 production had risen to ten thousand, but in that year the works were destroyed in the great Chicago fire. They were soon rebuilt, and in a year or two production had risen to nearly fifteen thousand, as a result of Mr. McCormick's terrific and tireless energy. He molded men to his will with scarcely an effort, and dashed all difficulties and obstacles from his path in a battering-ram fashion.

He worked so hard that occasionally he became overpowered by fatigue at most inconvenient moments. Once, after a very protracted work-spell, he came near missing a great business opportunity. Always friendly and hospitable to inventors, he had made an appoint-

ment at his residence with a man named Withington, who wanted to talk to him about his self-binder invention. He got home later than usual that night and terribly tired. Withington called that evening, and, just as he was beginning to get warmed up in his description of his really wonderful invention, McCormick's head nodded, and in a moment he was fast asleep.

Withington, furious at what he imagined was a deliberate affront, took the next train home.

When McCormick woke up it was morning, and he was greatly chagrined. So he sent one of his most trusted men in hot haste to explain matters to Withington and bring him back to Chicago. He struck a bargain with him and was the first to manufacture his ingenious machine, which, on a test near Elgin, cut fifty acres of wheat, binding, with its steel arms, every bundle and tying them with wire, without a single hitch or failure. Each Withington self-binder saved the labor of at least ten farm-hands.

Mr. McCormick at once started a tremendously aggressive selling campaign, and before long had disposed of some fifty thousand of the self-binders. Then he substituted twine for wire, manufacturing the twine at his factory, now greatly enlarged.

Mr. McCormick had a dogged determination and bull-dog tenacity that was simply extraordinary. He was not the kind of man to supinely submit to injustice, or brook any interference with what he considered his rights.

He fought one case, for example — his famous baggage case — in the courts for no less than twenty-three

years, the Supreme Court of the United States finally awarding him \$18,000 for nine trunks destroyed by fire on the railroad. But the railroad kept him waiting three years more, before sending him a check. The original amount he asked for was \$9,000. The interest increased it to \$18,000!

His fight for his patent was even more extraordinary. It having expired in 1848, he sought to have it extended, his legal battle lasting until 1865. His request for an extension of his patent was, however, finally refused on the ground that it was of "too great public benefit to be controlled by any one individual."

A wonderful fight began, when, in 1855, he hired lawyers to take legal action against certain manufacturers infringing his patent. He had William H. Seward, who later was Lincoln's Secretary of State, Senator Reverdy Johnson, and E. N. Dickerson for his counsel. But his opponents faced him in the courts with an array of legal talent almost without a parallel. Their lawyers were Abraham Lincoln, Stephen A. Douglas (Lincoln's political rival later on), Edwin M. Stanton, and three others.

It was a battle of master-minds, of legal giants, and Stanton, in a wonderfully eloquent and convincing speech, won a verdict against McCormick.

Lincoln earned his first fee — \$1,000 — in this celebrated harvester case, and when elected President appointed Stanton his Secretary of War.

About the time the Civil War was fomenting, Mr. McCormick was taking a great interest in politics. He did everything in his power to oppose the war spirit,

publishing powerful editorials in the *Chicago Tribune*, a newspaper he had purchased, and making many speeches. His plan for settling the controversy between the North and the South was known as the "McCormick plan," and had the indorsement of the *New York Tribune's* famous owner and editor, Horace Greeley.

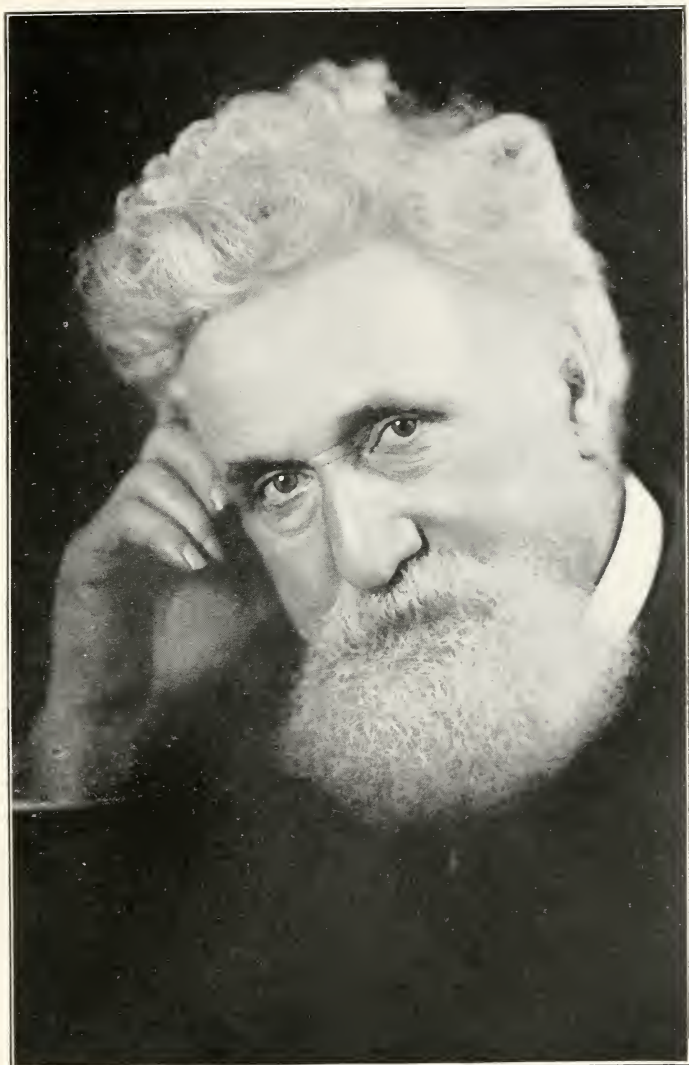
In 1861 it was said of Cyrus Hall McCormick:

"He will live in the grateful recollection of mankind as long as the reaping-machine is employed in gathering the harvest."

It would indeed be hard to estimate the value of his invention to the world in general and to the American farmer in particular.

HUDSON MAXIM

POET, PHILOSOPHER, AND WIZARD OF
HIGH EXPLOSIVES



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HUDSON MAXIM

POET, PHILOSOPHER, AND WIZARD OF HIGH EXPLOSIVES

IT seems strange now, to-day, that one of the world's most distinguished living scientists and inventors, Hudson Maxim, came very near going on the stage as a professional wrestler. It was on his first visit to New York that this almost came about. He was a green country boy of only twenty-four, and soon after arriving in the metropolis found himself in dire need of money.

His brother, who was with him at the time, introduced him, as a wrestler, to some sporting men, who arranged a match for him with a man named Flynn who had downed all antagonists up to that date and was challenging all comers. As, however, they had to put up some money for the Flynn challenge, they first tried him out with an English wrestler, whom he downed, then with no less a celebrity than "Matt" Grace, the ex-collar-and-elbow champion of the United States. He threw Grace the first bout, then was thrown himself twice. The boy Maxim was chagrined, and thought the match would be "all off." But to his surprise his backers were more than delighted. He had far exceeded their expectations.

So the boy from Maine, who had already made a reputation for wrestling — and boxing, too — in his

own State, decided, like the Unknown Knight of old in the Tournament, to enter the lists, and tilt for the prize.

He went on the stage — and threw the hitherto invincible Flynn.

His feat aroused tremendous enthusiasm, and very attractive offers were made to him to enter the sporting world and become a professional.

But Hudson Maxim had higher ambitions.

“It’s nothing to be able to wrestle,” he said. “I’m going to do something else.”

He little knew what, then!

This boy from the Maine backwoods, whose parents were so poor that he couldn’t get any schooling or even afford to wear shoes until after his ninth year, was always serious, studious and reflective. At an early age he began to think.

“I remember,” he remarked recently when recalling his youthful days, “that when twelve years old, I determined I would make my mark. I was crossing a field in which the grass had been killed by the cold, when I suddenly thought how closely man resembled a blade of grass — that life was a constant warfare between the summer of success and the winter of failure — and I then resolved that I would learn all I could and qualify for every kind of accomplishment within the range of my abilities, and would waste no time on non-essentials.”

Before many years had passed Hudson Maxim had made good his resolve and became, next to Thomas A. Edison, the world’s greatest inventor, as well as one of the most amazingly versatile men of his time.

The Maxim family is of English and French-Huguenot descent, and the man whose life and achievements we are relating, was born on February 3, 1853, in the village of Orneville, Maine. He was the fourth son of a family of six boys and two girls, his father being a miller and wood-turner.

In his childhood days the boy Hudson was not amused with the usual fairy-tales, or children's stories, in words of one or two syllables. Instead, his father would discourse to him of ancient wars, the great and bloody battles of history, legends of sea-fights, calamities on sea and land, pirates and ship-wrecks, earthquakes and volcanoes, wonders of the universe, mysteries of space and eternity. This was the boy's mental pabulum — the kind of stuff he was interested in from his earliest years.

His father, Isaac Maxim, was of a philosophical and inventive turn of mind. Long before ironclads, he had thought out and suggested a steel armor for warships and had also experimented with breech-loading and machine-guns prior to the Civil War. So it was from his highly gifted though very poor father that Hudson Maxim inherited his extraordinary inventive, poetical and philosophical faculties.

But though his father possessed energy and high mental qualities, he was very poor. Hudson often had to trudge the two miles to the district school through snow waist high. Hats and shoes were luxuries his father couldn't afford. But the boy never complained, for he was determined to learn all he could — to get some education at any cost to his comfort. In line with

this laudable resolve he would work in the fields a few days, or do heavy work in a granite quarry or brick-yard so as to earn a little money with which to buy school-books, for in those days school-books were not furnished free by school-boards. It took three days of hard work in the hay-field, at twenty-five cents a day, to earn seventy-five cents for a geography he had to have!

But young Hudson Maxim didn't mind either the hard manual work or the hardships, for he had a magnificent constitution and a powerful frame. He was getting bigger and stronger all the time and his muscles were as hard as nails.

Before very long, having got sufficient education for the purpose, a most unusual opportunity presented itself, over which, to-day, Mr. Maxim often has a hearty laugh. He was invited to teach school in a district where the boys were so bad that the trustees couldn't keep a teacher. The last one had been thrown through the window, sash and all. The young man accepted the call with alacrity and by thrashing all the bad boys one after the other, as they rowdied or "got fresh" with him, he very soon made himself respected and brought order and discipline into the school. Then he started in to teach his pupils in earnest, teaching himself at the same time, for, as he explains:

"I didn't know much more than they did; but as I learned faster I easily managed to keep ahead of my classes."

He then attended the Maine Wesleyan Seminary at Kent's Hill, where his inclination led him to specialize

in chemistry and other sciences. He was at this time unusually proficient in grammar and rhetoric, and had a remarkable faculty for memorizing anything poetical. Many of the poems he learned in boyhood he can still repeat word for word.

His first scientific discovery was made in 1875, when he was twenty-two. In this year he published in a scientific journal his theory of the "ultimate atom," which is that all matter is one in the ultimate, and that the difference in the various forms of matter and manifestations of force is due to the difference in the relative positions and motions of the ultimate atoms. His hypothesis, after some years, was generally accepted.

After he left school he was, from 1883 to 1888, in the subscription book-publishing business, and wrote and published a book on penmanship and drawing. He sold by subscription nearly half a million of these treatises, making a very substantial profit, the money from the sale of the books giving him his first capital, and enabling him to begin on a large scale his experiments with explosives.

In 1888 he left the publishing business to begin his dazzling and dangerous career of experiment and invention in the field of explosives.

His dynamite and smokeless powder mill at Maxim, New Jersey, he built in 1890. Smokeless powder was his first invention, and its enormous value in warfare soon became evident. For troops — especially sharpshooters — using "smokeless" can fire an unlimited number of shots at the enemy, from cannon or gun, without revealing their whereabouts by puffs of smoke.

The United States Government adopted smokeless powder, and the first they used was made at the Maxim plant. Later the E. I. du Pont de Nemours Powder Co., of Wilmington, Delaware, bought Mr. Maxim's inventions and plant, retaining his services as consulting engineer and expert.

This was his first big stride up the ladder of success.

His next great invention was Maximite, the first high explosive to be successfully used in armor-piercing projectiles. After long experiment at Sandy Hook by the U. S. Army the secret of its manufacture was bought by our Government in 1901. So insensitive to shock is Maximite — though fifty per cent. more powerful than ordinary dynamite — that a projectile charged with it can be fired from a big gun with perfect safety to the gunner, and will penetrate the heaviest plate and not explode until set off by the delay-action fuse.

Mr. Maxim then invented and developed a detonating fuse — superior to any other — for high explosive projectiles; then he invented Stabillite, a new variety of smokeless powder. Its great advantage is that it can be used as soon as made, whereas so many other forms of explosives require months to dry.

Stabillite was followed by Motorite, which is used instead of compressed air as the motive power for torpedoes. The Motorite is made in bars some five feet long, and these bars are squeezed into steel tubes, and sealed so that combustion can take place at only one end. When the bar is ignited water is forced into the chamber and the gases from the combustion, plus the steam, drive the torpedo.

Motorite cannot explode, will burn without air, and also under water. Mr. Maxim put more time and effort into this invention — Motorite — than into anything else he ever attempted.

In addition to driving torpedoes, Motorite can also be used to drive small torpedo-boats; and a new type of torpedo-boat designed by Mr. Maxim can be driven by Motorite through the gun-fire of a warship, however severe.

Carrying the explosive in its warhead this submarine torpedo-boat hurls itself, faster than a mile a minute, against a battleship's side. The result is a terrific explosion, followed by the destruction of the hostile vessel. Motorite propels this deadly and invulnerable under-sea projectile.

In experimenting with Motorite Mr. Maxim spent \$50,000!

Another of his inventions was a process for the continuous production of calcium carbide through heat developed by resistance in a molten carbide conductor. While experimenting in the manufacture of calcium carbide, he discovered, and invented, a process for making tiny diamonds.

Mr. Maxim is also the inventor of *The War Game*, a game of skill not unlike chess; but above all is he interested in poetry. His book on "The Science of Poetry and the Philosophy of Language" has won high praise from distinguished authors and scholars, and given a number of new words to the English language. He has written not a little verse himself, and the following is one of his most recent efforts:

BRITAIN'S GLORIOUS PART

BY HUDSON MAXIM

Since God broke chaos into light
And flung the stars upon the night,
And set the wonder of the day
Upon its high, celestial way,
Illuming into life and time
The unconditional sublime,
And vast insentience, touched with plan,
Felt that first throb whose end was man,
An all-pervading rightening sense
Has led on toward Divine intents.
In darkest hours of sore travail,
Doth still that leading sense prevail.

When eviling airs from Hell were spun,
And woke the blood-lure of the Hun,
Who every savagery combined
To conquer and enslave mankind;
Fair Belgium, greatened in her wrath,
Stood sword and soul athwart the path;
All France arose in battle-cry —
“They shall not pass, for here we die!”
Still, the unuttered Scourge of God
Rolled on, and slew and over-trod.

Soon after the world-war broke out Mr. Maxim devoted most of his time to problems of national defense, and in April, 1915, he published his sensational book, “Defenseless America,” which was tremendously influential in rousing the American people to their lack of *preparedness* for war. The motion-picture play, “The Battle Cry of Peace,” was founded on this book, of which Mr. Maxim has given away about one hundred and twenty thousand copies.

In addition to this book and other publications on Preparedness, the noted inventor gave much thought and study to a new army ration made mostly from soya beans, which were lately brought to this country from China, where they have been a leading food-staple since a time previous to the building of the thousands of years old pyramids of Egypt. Though rich in nutritious qualities these beans, because of their strong flavor, have always been unpalatable to Americans; but Mr. Maxim has overcome this objection through a special process of his own discovery.

Since the war broke out Mr. Maxim has invented a number of important (but, of course, secret) war-devices. One of these is a method of protecting ships from torpedo attack.

Mr. Maxim, by the way, went to England in 1897 to sell some of his inventions relating to high explosives, detonating fuses, ordnance for throwing high explosives, etc. In a notable lecture before the Royal United Service Institution of Great Britain he described and strongly urged howitzers bigger and heavier, by two tons, than those used by the Huns to destroy Liége. The Teutons evidently profited by his suggestion.

It was after the outbreak of the Spanish-American War in 1898 that our Government bought from Mr. Maxim the secret of Maximite, his wonderful high explosive.

Practically all his working life Hudson Maxim has been a world-leader in invention, research and discovery relating to explosives and other agencies of warfare, but though he has invented more terrible and

destructive agencies for use in war than any one else, he doesn't believe in fighting. He once said:

"I don't believe in war, I believe in peace, and the day is coming when peace will be universal.

"War is often a necessity, and when it comes we want the best tools we can get with which to fight.

"The use of such terrible explosives as I have invented makes for peace more than all the homilies that can be delivered. The debt that civilization owes to gunpowder is one of the greatest that history has to record. In every land and on every sea gunpowder stands guardian over all accumulated wealth and the progress of nations."

Mr. Maxim is of herculean build and strength, and has a voice of great depth and power that has been heard and understood a mile away. Because of his voice he has been called the "Fulminating Philosopher." His very broad shoulders and massive limbs tend to reduce his stature of five feet nine inches. He has a great shock of silver hair, a beard, and once wore an enormous drooping mustache. He more resembles a giant than an ordinary man.

His dark, glowing eyes betoken the dreamer. And he is a dreamer. But he makes dreams — trains of imaginative-inventive thought — come true. Out of his dreams come terrifying inventions that blast armies, destroy navies, rock mountains and continents. Armed with his inventions men become Titans!

It must not be supposed, though, that experimenting with chemicals and inventing high explosives is easy, pleasant and safe work. It is, on the contrary, terribly

dangerous. A little absentmindedness or slight lack of caution may cost a limb or one or many lives. The incident that cost Mr. Maxim his left hand is a case in point. He was testing the dryness of some fulminate compound, and, forgetting momentarily that he had a tiny piece remaining in his left hand, he applied a match to the bit he had broken off. A spark flew into the hand, and the next thing he knew, after the explosion, was that his hand had disappeared. All he saw was the bare bleeding end of the wristbone. His face and clothes were bespattered with flesh and bone splinters, and the next day his thumb was found on top of a building two hundred feet away! This happened in the morning, and it was evening before he could get a surgeon, as he had to walk a mile, ride in a wagon, then in a train and finally on the "L" road in order to reach his New York residence. Only a man of heroic mold could have gone through such a day!

In ten days he was back at his work again.

Mr. Maxim has a handsome town house on St. Mark's Avenue, Brooklyn. His laboratory is in the rear, and he is assisted in his experiments by his charming and devoted young wife whom he married in 1896. Her maiden name was Lillian Durban, and she is a notable scholar and linguist, and was once editor of a London review.

Mr. Maxim's country place, Maxim Park, N. J., where his main laboratory is situated, is on Lake Hopatcong, three miles from Maxim, the town where his workshops are located and where explosives are made.

Close by him lives Edwin Markham, the poet, who is one of his most intimate friends.

Mr. Maxim's only rest or recreation is a change of work. When he is not inventing deadly explosives, he is delving into such subjects as the origin and development of human speech, and oratory, poetry and rhetoric. He works without any sense of physical fatigue, for, as he says, "I was lucky to get a good, strong body," and he likes to vary his work — do different things. He believes that the great discovery of the future will be the harnessing of the energy stored in the sun's rays.

He is a great believer in the future of the airship, and, as the resistance of the air decreases with height, he says that a plane at an altitude of twenty miles should travel at a speed of one thousand forty-eight miles an hour! Go entirely round the world in seventeen hours!

Mr. Maxim is now sixty-six years old, but he is still working and experimenting, as hard as ever, on ordnance and explosives, and food problems — doing all he can to benefit his fellow men. He is a member of many learned and other societies, and has for long been recognized as one of the world's greatest men and benefactors.

JOHN H. PATTERSON

THE INDUSTRIAL GENIUS WHOSE RULING
PASSION HAS BEEN TO MAKE THINGS
“GO BETTER”



JOHN H. PATTERSON

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JOHN H. PATTERSON

THE INDUSTRIAL GENIUS WHOSE RULING PASSION HAS BEEN TO MAKE THINGS “GO BETTER”

THIS is a story of a man who spent his boyhood on a farm in Ohio. He was one of eight children. All his spare time, when not in school, was employed doing all sorts of odd jobs, either on the farm or in the saw and grist mills that his father owned.

When a boy he had one outstanding trait. He was always trying to improve upon something. He was never satisfied with a thing simply because it worked. He wanted to make it work better. One day he found fault with the big carriage that hauled the logs to the saw. It didn't seem to him to work right. The saw-mill was very busy at the time, however, and his father refused to stop the machinery merely to let the boy “meddle” with it.

But he was determined. The thing he set his heart on, he did. So the next morning he hurried down to the mill long before breakfast and began tinkering with the log carriage. When he was through and started it going, it worked smoothly without a hitch. The heavy logs were carried to the saw evenly and at the right speed.

“What have you done to it?” asked his father amusedly, that afternoon after school.

“Made it go better!” was the proud reply. He had put in new bearings, leveled the track with a spirit-level, and cleaned and oiled everything.

This little incident was typical of John H. Patterson, the boy. Nothing suited him unless it was *right*, and he never rested until he had made it so.

At last he left the old homestead for college. But, before graduating, he served in the Civil War as a Hundred-Day Man. At the expiration of his time of service he returned to Dartmouth College, and was graduated with the degree of B. A.

His first job on leaving college was that of toll-collector on the Miami and Erie Canal. Here he very soon found it necessary to give to each canal-boat captain a receipt for the money paid for tolls. This receipt was a check on the captains as well as on the toll-collector. After Patterson had improved the system, it worked so well that there were never any disputes or arguments. This was his first experience with receipts.

He stuck to his job, added to his store of business experience and, when he had saved a little money, he and his brother went into the retail coal business in Dayton. At the start the youthful firm ran up against a most annoying snag. Many of their customers disputed their bills, denying that they had received the quantity of coal or wood or lime that they were charged with. The young coal merchants were losing money every day.

But it did not take Patterson long to devise a method that would do away with these expensive complaints. Profiting by his experience as canal collector, he had receipts printed in five different colors. One color was for soft coal, one for hard coal, one for coke, one for wood, and one for lime. As each driver had to get a receipt from the customer upon delivery, this receipt was proof that the customer had received the goods he had paid for or been charged with.

As a result of this little reform the business doubled within a year. The receipts not only did away with disputes—they gave the firm a great deal of good advertising. Customers spread it around that this was a firm that charged them only with what they had signed for and always gave them a receipt for their money.

After the two brothers had been in the retail coal business for several years, they put money into some coal mines near Coalton, Ohio. In connection with their mines they ran a retail store. They did a big volume of business but, somehow, their profits were very small at the end of the year. It was evident that there was a leak somewhere, but there was no way of telling where it was.

Just about this time the partners heard that a man named Jacob Ritty had invented a machine which he called a cash register. It was a clumsy thing, but it did not take John H. Patterson long, after examining it, to decide that he could make his business “go better” with one of them. He ordered two. Crude and costly as the machines were in those days, the firm soon

had profits at Coalton instead of losses. The leak had been stopped.

This was the turning point in the life of the future captain of industry. Where most men would have rested content that their business was benefited, he had a vision. He recalled his initial business experience as a boy on his father's farm. His father had paid the hired help partly in provisions and it had been his duty to weigh or measure them out and to keep accounts. The cellar was the grocery, the barn the place where grains were kept, and the smokehouse the meat market. But there was no system of receipts, only a huge book of accounts which was kept in the hall. Somebody was always forgetting to charge a customer with the proper amount of goods. As a boy he had often been awakened at night by his father and asked if he had charged a certain person with goods he had taken home.

All these omissions and mistakes, Mr. Patterson recalled, had meant a loss to the sellers, not the buyers. It is human nature to forget, and if a customer is not charged with the goods sold him, the loss is the seller's.

So his memory went back to those early days and he realized how much money his father must have lost. Right there he made up his mind that there was a wonderful future for the cash register if it could but be perfected. The crude machine had helped him — a perfected machine would help every merchant. To think was to act, with Mr. Patterson. He and his brother bought out the concern which had made the two crude machines they were using in their store. These

early machines, by the way, had no cash drawers, no adding wheels, and did not print a receipt.

The brothers had a tremendous struggle to get the business started. No one had any confidence in the cash register, and they could get no financial backing. It was uphill work. At the end of the first few years, they had sunk practically all their money and were worse off than when they started. The crisis came when about \$50,000 worth of cash registers were thrown back on their hands because of poor workmanship. It was very discouraging, but Patterson never lost his faith in ultimate success. He was not the kind of man to give up anything he had determined to do.

He knew that the business was fundamentally sound, for it supplied a distinct need. He was convinced, from his own experiences, that losses were going on in every store in the country. The problem was to perfect his machine, when it was bound to find a ready sale. Even then he had in mind the day when he would build a machine that would issue a receipt and thus give the merchant maximum protection.

“For a long time,” Mr. Patterson stated not long ago, “our inventors were unable to design a machine which would print a receipt. It was the receipts that had doubled our coal business in a year.

“I knew that if we could get a machine which would print a receipt for the customer and make a duplicate record inside the register, it would do as much for every merchant as the receipt and the cash register had done for me as a merchant.

“My confidence in this business has never wavered.

It was based on my experience as a boy on the farm, in the grist mill, in the market, in the canal-collector's office, in the coal business, and as a partner in a retail store. The great lesson I learned from each was the absolute necessity of a receipt to the safe and sound conduct of business. So you can perhaps appreciate my enthusiasm for the receipt.

"I can almost say that the idea of giving and getting a receipt is responsible for the success of my business. With the obstacles, handicaps and discouragements under which we labored, I doubt if I would have had the faith to continue, had it not been that my own business experience convinced me that the receipt-printing cash register was needed throughout the world.

"The 'receipt' idea really gave me my start in business. What it did for me, it has done and will do for others."

Giving receipts for money, grain or goods, is, by the way, a very ancient custom. From earliest times the man who paid out money for goods was given some sort of document to enable him to account legally for his newly acquired property. The ancient Egyptians were very business-like in this respect. In our large museums you will find, carefully preserved, receipts for grain, rent money, and leases, written on scrolls as far back as 4000 B. C.

So Mr. Patterson was really only bringing a very ancient idea up-to-date when he perfected his cash register so that it could print and issue a receipt. His successful exploitation of the receipt idea resulted in the founding of what has become one of the world's finest

industrial plants, The National Cash Register Company. To-day it stands, a beautiful and impressive monument to man's foresight, upon the very spot in Dayton, Ohio, where John H. Patterson, as a boy, played and worked.

Mr. Patterson, however, had never seen any of these ancient instruments of trade. He arrived at his conclusion in a common sense, logical way. He knew that he got a receipt from the railroad,—a ticket. When he bought transportation from the Government he received a stamp, his receipt for his money. When he bought real estate, he got a deed. In fact, it was difficult to think of any business, outside of stores, in which a buyer did not receive a receipt for money spent. Then why should not merchants also give a receipt for each purchase? Yet very few did.

But steady perseverance with the receipt idea and effort to perfect his cash register at last resulted in complete success and he became one of our greatest leaders of industry. The road to success was a thorny one, however, for it took him eighteen years to sell his first half-million registers. The next five hundred thousand he sold in five years, and now cash registers leave his factory at the rate of two every five minutes. To-day the plant founded by Mr. Patterson covers almost fourteen city blocks, and the floor space of nearly fifty acres accommodates some six thousand seven hundred workers.

The cash register of to-day is an ornament to any store and a familiar sight the world over. But exactly what, you may ask, does the machine do? When

the merchant owning a cash register closes his store for the day, his register tells him:

How much business each clerk has done, and how many customers each has waited on: the total amount of money taken in: the number of "charge," "rec'd on acct" and "paid out" transactions handled during the day. If any mistakes have been made, the register tells who made them. It also prints and issues a receipt or prints figures of the amount paid or charged on an original and duplicate sales-slip. It also prints a permanent record of each transaction on a strip of paper inside the register.

Thus at the end of the day the merchant has before him, legibly printed in indelible ink, a complete record of the day's business.

It was very different before the day of the cash register. A customer might come in, buy something, and ask the clerk to charge it. The goods that went out represented money to the merchant. Yet all he had to show for that money was a little scrap of paper. If that paper was lost, his profit was lost besides what the goods had cost him. More than that, if the clerk forgot to make the charge entry, there was absolutely nothing to show for the goods the customer had taken. All this is impossible with the cash register.

Mr. Patterson is of Scotch-Irish ancestry. His first American ancestor, his grandfather (whose father arrived in this country in 1728), was a colonel in the War of the Revolution and the founder of Lexington, Kentucky. He afterwards owned much of the land upon which Cincinnati now stands, and finally located a

large tract of land near Dayton, the present home of the family.

John H. Patterson's greatest achievement is bringing to perfection the wonderful mechanism known as the cash register. It took years of patient study and costly experimentation. First one improvement was made, then another, and so on, until it almost seemed that no further improvement could be possible. Yet always the search has been on for ways of making the register of even greater service to the merchant, and those who know Mr. Patterson know that he will always continue trying to make the machine "go better."

He has been called by other employers a "revolutionist" because of his humane way of treating his employees. Through good and healthful environment, he has put beauty and joy into their lives. He is, in fact, the pioneer among industrial leaders in social welfare work, for he was one of the first large employers of labor to discover that poor working conditions and poor wages mean poor output and a poor product. "Make the man right, and he will make the product right," has been Mr. Patterson's motto. So when he built his new plant, he included in it every possible convenience and comfort for his employees. To-day this model plant probably has no superior in the world.

Quick failure was predicted when the new steel and glass palace of industry was built. "Why," chuckled one critic, "the boys of 'Slidertown'" (the section of the city in which the factory was located), "will smash every window in it."

But Mr. Patterson had already had that very experience with the so-called "bad boys" of Slidertown. And he had solved the problem with characteristic promptness and success. Reasoning that the bad boy was merely the boy of energy plus, without legitimate outlet, he had provided a house and grounds and taught them gardening, carpentry and a lot of other useful things. There were no windows broken in the crystal palace of the N. C. R.

The boys have their playgrounds, workgrounds, and clubhouse. They have formed the Boys' Garden Company and the Boys' Box Furniture Company, both incorporated. The Boys' Box Furniture Company makes and sells simple but attractive furniture. The material is packing boxes, furnished by the N. C. R. Company. The Boys' Garden Company raises garden produce for their own homes and for sale. Both companies are self-administered and the boys divide the profits. To gain admission to the Boys' Furniture Company, a boy must have done two years of gardening and have received his diploma from the Boys' Gardening Company. After a year at carpentry, he is eligible for employment at the National Cash Register plant, and you may be sure that he looks eagerly forward to entering the "works." If every industrial establishment in the land took the same steps toward directing the energies of the boys of their neighborhoods in the right direction, there would be fewer "bad men" and prisons.

There are many educational features at the National Cash Register City Club. Owl Classes are conducted

in salesmanship, business and shop practice, etc. All employees are encouraged to attend. Then there is the Hall of Industrial Education at the plant where frequent talks are given employees by scientists, experts on right living, and other prominent men. These talks are given largely on the company's time. Mr. Patterson often alludes to the "Schoolhouse" as the "powerhouse" of the company. Each noon there is an entertainment held in this beautiful hall, usually consisting wholly or in part of moving pictures.

The National Cash Register Company was the first plant in America to put in force a minimum livable wage for girls. The girls are taught calisthenics, have their own clubs, and during working hours are provided with rest rooms and rest periods. There are completely equipped hospital and dental rooms, with doctors, dentists and nurses always in attendance. Every possible precaution is taken to safeguard the health of National Cash Register workers. The machines are guarded by safety devices, the air in all buildings is changed every fifteen minutes. The drinking water is regularly analyzed. The wash-rooms are kept scrupulously clean and sanitary, the old roller towel has been replaced by individual hand towels, and common drinking cups have given way to bubbling fountains. Brushes and combs are sterilized daily. There are modern shower-baths and each employee is permitted to enjoy one bath a week in winter, and two each week in summer on the Company's time.

Special care and attention is given to the health and welfare of women workers. They come to work later

than the men and quit earlier to avoid crowded street-cars. The old style uncomfortable stool has been replaced by the high-back chair with foot-rest. In rainy weather, overshoes and umbrellas are furnished. There is also a large library for the use of the employees.

The National Cash Register has three large dining-halls; one, known as the Officers' Club, where the executives, heads of departments and others of the employees eat, a huge dining-hall for the men and a third dining-hall for women employees.

Mr. Patterson has never confined his efforts to doing good merely for his own people. A favorite motto at his factory is "What is good for the National Cash Register is good for other people." Never has he spared effort or money when he could see a way to spread the gospel of right living. Several health lectures have been prepared by the Company physician. These are illustrated with stereopticon slides and moving pictures, and have been given in many towns and cities. One of the health lectures was especially prepared with the intention of teaching our soldiers social hygiene. It was heartily endorsed by the United States army officials and was given to more than a million soldiers in twenty-one cantonments. A special war lecture, "Wake Up, America!" was arranged under the direction of Mr. Patterson and given all over the United States after the entrance of this country into the war. All of the expense in connection with these lectures was borne by the Company.

When war was declared, Mr. Patterson immediately offered his own services, his plant and all its resources

to the Government. The record of the National Cash Register during the war spoke volumes for the efficiency and morale of the organization. The Company was called upon to make instruments of precision which required the greatest possible exactness in manufacture. Without any previous experience along this line, the National Cash Register was, within a few short weeks, putting the manufacture of these instruments on a quantity production basis. The motto of the Company became "War first, business second — if there is any time for business."

In 1918, Mr. Patterson presented to the city of Dayton, three hundred acres of land which is known as Hills and Dales Park. Included in this magnificent gift was a fully equipped country club, which had previously been used by his employees. This gift was valued at one million dollars, and was given as a reward for good government in the city of Dayton.

When the great flood came to Dayton, in March, 1913, the National Cash Register plant was untouched, as it stood on high ground. Mr. Patterson immediately summoned his executive force and announced: "I declare the National Cash Register Company out of commission and I proclaim the Citizens' Relief Association." Shortly afterwards, he made a rough sketch of a boat and ordered that some be made immediately. The first boat was brought to the water in fifteen minutes; after that the factory turned out boats at the rate of one every seven minutes.

The people of Dayton turned to Mr. Patterson at the time of their great need. He headed the relief

work and attended to everything with such wonderful efficiency and generalship that when General Wood and Secretary of War Garrison arrived on the scene, they stated that Patterson had done all that could be done — they could do nothing more. It was some time before the waters subsided, meanwhile the National Cash Register was doing only relief work, caring for more than twenty-five hundred homeless flood victims. And John H. Patterson, who as a boy had a passion for making things “go better,” was acclaimed as the man who saved Dayton.

From the time he made the machinery in his father's saw-mill “go better,” he had been applying the same rule to everything he took hold of. This passion for perfection — for efficiency plus — is the secret of success. The boy who makes his tools better than any one else's and then uses them better than any one else, is bound to succeed in life.

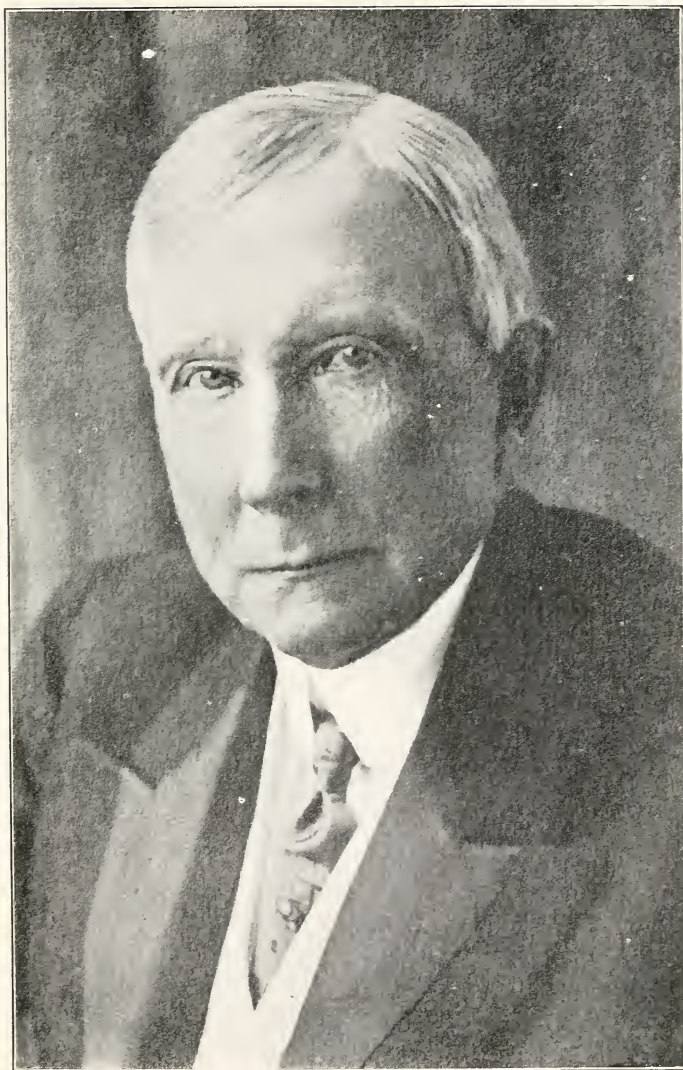
John Henry Patterson has now been the President of The National Cash Register Company for more than a third of a century. His name and “National Cash Register” are linked together in the minds of all civilized peoples. The fame of the National Cash Register has gone around the world. National Cash Register standards of living and working are recognized as being synonymous with all that public-spirited men are working for along industrial lines. In 1900, after an exhibit at the Paris Exposition of his Company's output, Mr. Patterson was awarded the decoration of the Legion of Honor by the French Government.

His career is one long record of a life devoted to hard

work and useful invention for the benefit of his fellow men. In the Hall of Industrial Fame, John H. Patterson will always occupy a prominent niche.

JOHN DAVISON ROCKEFELLER

**OIL KING AND WORLD'S GREATEST
INDUSTRIAL LEADER**



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JOHAN D. ROCKEFELLER'S first business experience was at the age of eight, when he became the owner of a few turkeys. At once he was confronted with certain hard realities of life that had never occurred to him. He had no money — yet he had to supply the birds with food! It was in a way an amusing predicament he was in — for his livestock threatened to turn out a white elephant. His mother, however, came to the rescue, presenting him with the curds from the milk to feed them. This solved the boy's problem, and, as he took care of the birds himself, their keep cost him nothing. After a while he sold his turkeys in a businesslike way, the money he received for them being all profit.

John was only a little boy when he conducted this, his first commercial transaction, but it was a valuable lesson in business, for he learned that capital is necessary to conduct any kind of business. This gave him some idea of the value of money (capital), and led him into habits of thrift. Later on in life when asked, at his fine home at Pocantico, how he managed to buy such a large and fine estate, he replied:

“By saving my pennies.”

The richest man in the world's earliest philanthropic work was in lifting the mortgage from his home church. His parents were Baptists and, from his earliest age, John had taken a great interest in church work. He was a constant attendant, and soon became a leader among the young people. When only eighteen he was elected a trustee of his church. For some years the church had been struggling along under a debt of \$2,000. One Sunday, to John's horror, the minister announced that the mortgage was about to be foreclosed, and that unless the congregation quickly raised \$2,000 they would lose their church building.

The announcement made a profound impression upon the youth, and, after the service, he posted himself at the church door, and buttonholed the worshipers as they came out, insisting upon getting from each one of them a promise of a contribution toward canceling the debt. He continued his campaign for some months, and a proud day it was for John D. Rockefeller when he collected the last cent, and the mortgage was burnt amid general rejoicings. This was, Mr. Rockefeller said once, the hardest work he ever did!

As a boy the future Oil King was brought up in the good old-fashioned way. "Spare the rod, spoil the child," was his mother's motto, and she proved a "good deal of a disciplinarian," upholding the standard of the family with a birch switch whenever it showed a tendency to deteriorate.

He was, for example, once soundly whipped for something he didn't do. After the whipping, when he was able to explain, his mother said: "Never mind, we

have started in on this whipping, and it will do for the next time.”

On another occasion, John and the boys with whom he used to play went skating by moonlight — something he was forbidden to do. No sooner had they got started than they heard a cry for help, and found a neighbor who had broken through the ice and was nearly drowned. By pushing a pole to him, the boys saved his life, restoring him safe and sound to his grateful family.

John and his brother William thought that because of this episode, the saving of this man's life, they would be “let off” and not punished for their disobedience. But, to their dismay, the idea proved to be erroneous! The birch was had in requisition as usual.

In this way was the habit of absolute obedience sternly drilled into the Rockefeller children.

Mr. Rockefeller is a native of Tioga County, New York, his grandfather, Godfrey, coming from Massachusetts and settling in Richford. In this village John Davison Rockefeller was born on July 8, 1839. While a child his father, William A. Rockefeller, drifted here and there, finally settling in Cleveland, Ohio, where he built a house for the family.

By this time, John, his eldest son, was a lad of fourteen and had had about the same boy-experience that falls to the lot of most boys. He had attended district school and done such work as chopping wood, taking care of horses, milking cows, weeding the garden, raising chickens and turkeys. He was, however, a silent, secretive sort of boy and never mixed with other

youths. He went about things in a somewhat earnest and solemn way, but, whatever he had to do, he usually did well.

His father was tall and fine-looking, with a dominating personality, a great hunter and an unusually fine shot. He was, too, a very shrewd, practical man and Mr. Rockefeller has often acknowledged owing a great debt to his father for training him in practical ways. He was engaged in numerous enterprises, large and small, about which he used to talk very freely to his son John, explaining their significance; in addition, he tutored him in the principles and methods of business.

As a result of his early business training, the boy kept a little book, which he called "Ledger A," in which he used to set down all the money he made and all the money he spent, and also all sums he had given away in charity — for he had been taught to give regularly a certain percentage of his receipts to charitable objects. This little ledger is still in Mr. Rockefeller's possession and he is said to prize it above rubies.

It was the intention of his parents to send John to college, but he was anxious to go to work, so when he reached the age of sixteen he was taken from the high school where he had almost finished his course and sent to a commercial college in Cleveland. Here he was taught bookkeeping and some of the fundamental principles of commercial transactions, and this training, though lasting only a few months, proved of great value to him.

John's education being finished, the next thing for him to do was get a job. This was by no means easy,

however. "I tramped the streets for days and weeks," Mr. Rockefeller relates, "asking merchants and storekeepers if they didn't want a boy." But no one seemed to need a boy, and "very few showed any overwhelming anxiety to talk with me on the subject. At last one man on the Cleveland docks told me that I might come back after the noonday meal."

He was in a fever of anxiety lest he lose this opportunity, but when, betimes, he presented himself to his prospective employer, he said: "We will give you a chance." This was on September 26, 1855, and no word was said about pay.

John went to work joyfully and with much energy and enthusiasm. When January came, his employers, Hewitt & Tuttle, gave him \$50.00 for three months' work. These were his first real wages and the amount, \$50.00, seemed to the boy almost a fortune. The firm was a wholesale produce commission and forwarding concern and John's work was clerical, in the office, under a bookkeeper who was a fine executive and disciplinarian and who received \$2000.00 a year in lieu of the profits of the firm of which he was a member.

Beginning with the new year, John's salary was raised to \$25.00 a month and when at the end of the year the bookkeeper left he took his position and did the work at a salary of \$500.00 a year.

As the firm's business was general and very extensive, young Rockefeller got an unusually valuable experience in business. It was not long before he began to audit accounts and make himself useful in all sorts of business negotiations. In the passing of bills, col-

lecting rents, adjusting railroad, canal and other claims, he met all sorts of people, against some of whom he often had to pit his own shrewdness, and all this increased his business knowledge and efficiency.

The next year he was offered a salary of \$700.00, but considered that he was worth \$800.00. When April came, this salary matter not having been settled, he resigned because of an opportunity he saw to go into the same business for himself. This opportunity came about in this way: Among the merchants in Cleveland, whose acquaintance he had made, was a young Englishman, M. B. Clark, who at this time wanted to enter business for himself and was looking for a partner. He had \$2000 and was looking for a man with a like sum. Young Rockefeller had been very thrifty, but he had only saved about \$800, and didn't know where to get the balance. On talking over the matter at home, however, his father told him he had always intended to give each of his children \$1,000 when they reached twenty-one. He offered to give John his share then and there if he would pay him interest at the rate of ten per cent. until he was twenty-one.

Needless to say, John gladly accepted his father's offer, and the new firm of Clark & Rockefeller was launched. "It was a great thing to be my own employer," Mr. Rockefeller once said. "Mentally I swelled with pride — a partner in a firm with \$4000 capital!"

Young Rockefeller was junior partner and had charge of the finances and books. Mr. Clark attended to the buying and selling. The firm at once began

to do a large business, dealing in carload lots and cargoes of produce, and before long needed more capital to handle their growing business.

Mr. Rockefeller, as financial head of the firm, had now to negotiate his first loan. In some fear and trembling he asked the president of the bank for \$2,000. His reply was: "All right, Mr. Rockefeller, you can have it. Just give me your own warehouse receipts; they're good enough for me."

The fact that a bank was willing to loan him \$2000 greatly elated the young merchant, and he began to feel himself of some importance in the community. He was a business man!

Mr. Rockefeller now began to go out and solicit business, something he had never done before. In the course of his drumming, he pretty well covered Ohio and Indiana. To the surprise of the young partners, business increased so rapidly they could scarcely take care of it, and their first year's sales amounted to half a million dollars.

Of course, they had to keep on borrowing money as their business expanded, and young Rockefeller's loans from his father were many. Once in a while — usually at very awkward times — his father would suddenly "call" a loan, saying: "My son, I find I have got to have that money."

"Of course, you shall have it at once," John would cheerfully answer.

His father did not need the money, but was simply applying a wholesome test, and in a week or two would offer it back again. John was not particularly pleased,

however, with his father's tests to discover if his financial ability was equal to such shocks.

But it was very difficult in those days to raise money for business enterprises, and John was glad to pay his father the ten per cent. interest he charged him. This was the ruling rate in those days, though considered too high by many.

Meantime, the produce business of Clark & Rockefeller went on very prosperously and in the early sixties they organized a new firm to refine and deal in oil. It was composed of James and Richard Clark, Samuel Andrews and the firm of Clark & Rockefeller, who were the company. Mr. Andrews, who had mastered the process of cleansing (refining) crude oil with sulphuric acid, was the practical man in the concern in charge of the manufacturing. In 1865, however, the partnership was dissolved and after settling the concern's indebtedness and collecting the money due it, it was decided to auction off the plant and good will.

By this time, young Rockefeller had waked up to petroleum possibilities. With the intuition of genius, he divined in a flash the wonderful opportunities all around him in the refining of oil. He saw the number of oil wells rapidly increasing and a great and growing business springing up in oil. So he was seized with the desire to pull out of his produce business, buy this oil plant and go into partnership with Mr. Andrews.

The day of the auction arrived and the bidding started in at \$500.00. Young Rockefeller at once bid \$1000, and then the bidding slowly mounted to \$72,-

000. Mr. Rockefeller, although he didn't exactly know where he could get such a large sum from, at once bid \$72,500. Upon which, Mr. Clark, who headed the other faction, said: "I'll go no higher, John; the business is yours."

"Shall I give you a check for it now?" asked Mr. Rockefeller.

To which Mr. Clark replied: "No, I'm glad to trust you for it; settle it at your convenience."

And so, as Mr. Rockefeller so modestly narrates in his recent book, "The firm of Rockefeller & Andrews was then established and this was really my start in the oil trade. It was my most important business for about forty years until, at the age of about fifty-six, I retired."

The oil business turned out to be for a long time a precarious and highly speculative business. The business of refining oil was a comparatively easy one, and soon every Tom, Dick and Harry was in the business. There was, too, an over-supply of petroleum and prices went down and down. This over-production raised some great problems and one of the most important and probably most difficult was to find foreign markets.

So the new oil firm found itself under the necessity of increasing its capital, of securing the best talent and experience obtainable, of buying the largest and best refining concerns, and of centralizing the management to secure greater economy and efficiency and at the same time a wider market.

Notwithstanding occasional setbacks, the business of

the enlarged firm grew at an unexpected rate, necessitating branch refineries, storage tanks, agencies and large stocks at the most important seaboard cities and later on came the tremendous feat of establishing pipelines, through which the oil was pumped to markets at a great distance. These pipelines, upon which the entire oil business is dependent, were followed by other revolutionary improvements such as tank-cars and tank-ships, the latter, vessels especially constructed for the transportation of oil in bulk to tropical and other countries.

In 1867, William Rockefeller & Co., Rockefeller & Andrews, Rockefeller & Co., and S. V. Harkness & H. M. Flagler united in forming the firm of Rockefeller, Andrews & Flagler, and this was really the starting point of the Standard Oil Co. Their reason for thus combining was to secure greater economy and efficiency and a larger business. As time went on and the vast possibilities of the oil industry became clearer, they induced others to put in money, and organized the Standard Oil Co. with a capital of one million dollars. This capital was increased in 1872 to \$2,500,000 and two years later to \$3,500,000. At the present time the total capital of the Standard Oil Co. and its subsidiaries or allied corporations probably exceeds a billion dollars.

A great many people have been lost in wonder at the amazing growth of the Standard Oil Co. and some people have not been backward in accusing it of unfair business methods. Mr. Rockefeller himself only a few years ago said that he ascribed the success of the Standard Oil Co. to "its consistent policy of making

the volume of its business large through the merit and cheapness of its products. It has spared no expense in utilizing the best and most efficient method of manufacture. It has sought for the best superintendents and workmen and paid the best wages."

As a matter of fact, Mr. Rockefeller had faith in American oil, and was successful in bringing together vast sums of money to push it, against Russian and other competition, into every quarter of the world. He also utilized the by-products of the raw oil, building up a vast business in these alone, developing more than two hundred products of petroleum, such as vaseline, candles, etc. Every kind of transportation — elephants, camels, burros, rafts, tank-vessels, Chinese and Indian coolies — helped in illuminating the remotest quarters of the world with Standard oil.

About 1893 — the panic year — Mr. Rockefeller became heavily interested in the iron-ore mines in the Northwest, later on building a fleet of ships on the Great Lakes to market his ore. Still later the whole immense properties were turned over to Mr. Carnegie's steel company at a good price.

Mr. Rockefeller was led to use his brain and money in these iron properties through the fact that he had, some years previously, made some investments in the stock of iron companies. These proving unremunerative, he got an associate, Mr. Gates, to go out there and report upon them. The report being unfavorable, as to management, financial condition, etc., he decided to buy out the owners, and operate the mines himself. His judgment as to their possibilities was as usual correct.

“Going over again in my mind,” said Mr. Rockefeller once, “the events connected with this ore experience that grew out of investments that seemed at the time to say the least, rather unpromising, I am impressed anew with the importance of a principle I have often referred to. If I can make this point clear to the young man — it may be benefit to him.

“The underlying, essential element of success in business affairs is to follow the established laws of high-class dealing.

“Keep to broad and sure lines, and study them to be certain that they are correct ones.

“Watch the natural operations of trade, and keep within them.

“Don’t even think of temporary or sharp advantages. Don’t waste your effort on a thing which ends in a petty triumph unless you are satisfied with a life of petty success.

“Be sure that before you go into an enterprise you see your way clear to stay through to a successful end. Look ahead.

“Study diligently your capital requirements, and fortify yourself fully to cover possible setbacks, because you can absolutely count on meeting setbacks.

“There is no mystery in business success — there can be no permanent success without fair dealing that leads to widespread confidence in the man himself, and that is the real capital we all prize and work for.”

Mr. Rockefeller believes that disinterested service is the road to success. To the boy or young man starting out in life, he says:

“ If you aim for a large, broad-gauged success, do not begin your business career, whether you sell your labor or are an independent producer, with the idea of getting from the world by hook or crook all you can.

“ In the choice of your profession or your business employment, let your first thought be: Where can I fit in so that I may be most effective in the work of the world? Where can I lend a hand in a way most effectively to advance the general interests?

“ Enter life in such a spirit, choose your vocation in that way, and you have taken the first step on the highest road to a large success.”

The great fortunes made in this or other countries, Mr. Rockefeller believes, have come to those men “ who have performed great and far-reaching economic services — men who, with great faith in the future of their country, have done most for the development of its resources.”

As Mr. Rockefeller is doubtless the most successful business man that ever lived, the boy or young man starting out in life would do well to ponder seriously what so distinguished an authority has to say about getting on in the world. Some young men jump from one occupation to another in their anxiety to make a fortune rapidly and in the end get nowhere, have nothing. Mr. Rockefeller’s advice is, “ Don’t change; just stick to one thing until you succeed at it . . . do not be discouraged, and save, save, save! Unless you practice thrift, you can never become much. Lay aside every dollar you can, and after awhile you will have enough to start in business.”

Mr. Rockefeller early in life learned the value of money. He found that he could get as much money, in interest, for \$50 loaned at seven per cent. as he could by digging potatoes for ten days. "I thus learned," he says, "that it is a good thing to let money be my slave and not make myself a slave to money. . . . Make good bargains; save your money and let it work for you.

"Wed natural ability to hard work and you have a combination that nothing can defeat."

The most successful men in our country have been the men who have had confidence in the United States and its resources as well as confidence in their fellow man. It has been the optimist who has succeeded.

Mr. Rockefeller is no exception to this rule, for it was his faith in one of America's greatest natural resources — oil — plus his tremendous energy and courage, that placed our country in the first rank of petroleum producers and made him — John Davison Rockefeller — America's foremost business man and leader of industry as well as the world's richest man and greatest giver to philanthropy.

CHARLES M. SCHWAB
STEEL KING AND SUBMARINE BOAT
BUILDER



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CHARLES MICHAEL SCHWAB

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ASTOR LENOX AND TILDEN FOUNDATIONS
1900

CHARLES M. SCHWAB

STEEL KING AND SUBMARINE BOAT BUILDER

BOUNDLESS are the opportunities of youth!
At twenty-five, Superintendent of the big Carnegie Homestead Steel Works!

At twenty-seven, General Superintendent of the Edgar Thompson Steel Works, Braddock!!

At thirty-five, President of the Carnegie Steel Company!!!

At thirty-nine, head of the greatest corporation ever formed in the history of the world — the great billion-dollar steel trust!!!!

And now the head of Bethlehem Steel, the second largest corporation in the world!!!!!

A wonderful and dazzling career for this poor Pennsylvania boy who had to drive a stage for his father's livery stable, clerk in a grocery store, and then drive stakes at \$1.00 a day!

But this boy had more than his share of grit and gumption, of keen-mindedness. As the man who gave him his first real job at \$30.00 a month said: "He's willing and bright, *and he wants to know everything.*"

This passion of his for knowing everything — for understanding and getting to the bottom of things — led him rapidly to the top of things, as we shall see.

It was in the Keystone State, at Williamsburg, that Charles Michael Schwab — the future master of men and millions — was born on April 18, 1862. The Schwab home — a little log cabin — was swept away by the Johnstown flood in 1889, but, long before this event, the family moved to the mountain hamlet of Loretto, where there was a convent of Franciscan monks which had been founded by the royal priest Gallitzen a century back. In this picturesque spot on the crest of the Alleghenies, at the College of St. Francis, run by the monks, Charlie studied for two years, after attending the local school.

Charlie was fond of mathematics, being especially attracted to engineering problems. After leaving college a full-fledged engineer he naturally expected to land a good position where his knowledge and talent would be useful and valuable. But instead he had to drive his father's stage between Loretto and the railroad station, five miles away.

But soon his father moved to Braddock, and Charlie then became a grocery-boy in the Spiegelmire store. Spiegelmire had often ridden in the stage driven by his old friend's son, and had made up his mind, from his promptness and expertness, that the smiling, good-humored lad was no ordinary boy, so when the family located near-by he offered Charlie Schwab a job. Though the boy had other and higher ambitions he cheerfully set to work, serving customers, running errands, sweeping the store, in addition making himself very agreeable in his employer's household at night with his piano-playing and voice.

Whatever he did, he did his best, giving his employer good measure, and always did he work smilingly as if work were a pleasure. He soon made lots of friends, for everybody liked the young groceryman with such pleasant manners — and then came along *opportunity*.

An occasional customer was Captain "Bill" Jones, a big man in those parts, the superintendent of Andrew Carnegie's Steel Works. One day when he dropped into Spiegelmire's for his plug of tobacco the youth screwed up his courage to the sticking point and, as Mr. Schwab once related:

"I asked 'Bill' for a place in the mill.

"'Can you drive stakes?' he asked.

"'I can drive anything!' I replied."

The next day Charlie Schwab was driving stakes, for a dollar a day, in Carnegie Brothers' mill. His job was carrying chains and driving pegs, but he did his best as usual, and in six months he was a gang-boss.

Within six years he was superintendent of the works, then the largest steel plant in the country.

How did he do it — become, at twenty-five, a forgermaster?

By amusing Captain Jones and Mr. Carnegie with his piano or organ-playing or singing of Scotch ballads?

Bless us, no! These were both hard-headed, shrewd men who never employed a man who couldn't make money for them!

He did it by specializing in chemistry and by applying his chemical knowledge to the manufacture of steel. No one had dreamed of such a thing as the chemistry of

steel before, and everything was done by rule of thumb.

Young Schwab gave his nights to the study of chemistry and before long he was conducting important experiments in testing the quality and strength of steel in various processes.

At twenty-four he had some seven thousand men under him, and had revolutionized the steel business, for he "knew more about it than any other man in the world," according to Mr. Carnegie.

It is little wonder that Mr. Schwab advises young men to "marry early." He himself married at twenty-one, and it is to his wife, who was ever urging him on to study of the chemistry of steel, that he largely owes his preëminence as a steel manufacturer. After he had mastered the chemistry of iron and its compounds Superintendent Schwab was able to inaugurate processes of steel manufacture that largely cut down costs, and brought profit where before there had been loss.

Seven years after entering the steel industry, the grocer's boy had designed and built the great Homestead Works, and become one of Andrew Carnegie's partners! In 1889 when Captain Jones died, Mr. Carnegie sent him to Braddock to succeed "the greatest steel man in the world," giving Schwab a stock interest in his business amounting to \$50,000, and a salary of \$50,000 a year.

This was the rapidest rise for a boy on record! Later on, when somebody tempted Schwab with a huge salary to go abroad, and he refused, his loyalty so touched Mr. Carnegie that he made a new arrangement with

him on the basis of a minimum salary of \$1,000,000 a year.

It was this contract that seemed to bother the great financier, the late J. Pierpont Morgan, when all the Carnegie interests were formed into the billion-dollar trust. He had heard of \$100,000 salaries, but of million-dollar ones, never!

Schwab, like all real geniuses, cared little for money or salaries. Work was all he cared for, and his heart was in it.

“What’s to be done about this?” asked Mr. Morgan, significantly, holding out the contract which had just put \$1,300,000 into Schwab’s pockets for a year’s work.

“This!” was Mr. Schwab’s reply — and he crumpled it up and flung it into the waste-basket.

When Mr. Carnegie heard this he was again much touched. “Only Charlie would have done that!” he said, and he sent him bonds in the new corporation for the whole amount of the contract.

The Scotch iron-master was a man of heart, and he believed in rewarding honesty and fidelity. Men who made a habit of subordinating their own interest to their employer’s, who had ideals of work far above mere money rewards, were scarce — very few and far between.

Carnegie was now out of the steel business — had been paid half a billion dollars for his interest — and Schwab, the boy-president, as he was called, now headed the most gigantic industrial enterprise the world had ever heard of — the United States Steel Corporation.

Step by step the Loretto boy had climbed the ladder of success from its very lowest rung. He had thrown himself heart and soul into everything he had to do, and given the best there was in him to every kind of work that came along. After mastering his own job, he had always tried to understand the one a step higher. "The surest way," said Mr. Schwab once, "to qualify for the job ahead is to work a little harder than any one else on the job one is holding down.

"To my mind," continued the boss of Bethlehem, "the best investment a young man starting out in business can possibly make is to give all his time, all his energy, to his work — just plain, hard work."

Mr. Schwab's advice to the young man starting out in life is to go to the work he delights to do. Unless a boy takes a real delight or pleasure in his work he might just as well leave it alone. Scrupulous honesty is absolutely essential to success, and fidelity is equally important.

"What gave me my first start in life," said Mr. Schwab once, "was my loyalty and my integrity and my standing by the man that gave me my start. He was a good old Welshman, a Welsh steelmaker; a man of sturdy character and a great man. In those early days I had a smattering of chemistry and mechanics and I soon discovered that what my superior needed was support and strength in that line. I therefore qualified myself to do and know the things which he didn't know, and soon I grew to be very valuable to him.

"I took care to have him think that I was not a smart youngster who knew more than he did. And I

loved that man because of his interest in me and I loved to teach him without his knowing that I taught him the things he didn't know, and when I grew to manhood and into positions far more important than he occupied, and when later in life it became my opportunity to select the proudest position, I said to Mr. Carnegie, 'There is no position that you can offer me that will make me so proud as to be the successor of my old master, Captain Bill Jones.'

"Therefore I attribute my success in life to my loyalty to the man who gave me my start."

As Mr. Schwab began life with an empty pocket — without a cent in the world — and never received a dollar he did not work and work hard for, his advice is worth heeding by every boy in the land. His marvelous career is an inspiration to every American youth, for what one boy has done another can do.

"I work," he said once, "just for the pleasure I find in work, the satisfaction there is in developing things, in creating. . . . The man who does not work for the love of work but only for money is not likely to make money or to find much fun in life."

After being the President of the great Steel Trust for three years, and one of the busiest men in the world, Mr. Schwab suddenly resigned. His leaving the billion-dollar corporation aroused world-wide surprise, and all sorts of rumors were sent flying around. One was that he had a violent quarrel with the rather peppery Mr. Morgan — the "watch-dog" of Wall Street.

As a matter of fact it was caused by a clash of prac-

tical and impractical ideas, and Mr. Schwab's action in resigning was characteristic of the man. "I was hampered," explains Mr. Schwab, "by directors and other interests. . . . If I thought a mill ought to be built at Pittsburgh I didn't want an important director telling me it ought to be built at Chicago. If I had a strike involving a principle, I didn't want to be told to settle it for fear it might affect the stock market."

So Mr. Schwab quit — gave up a salary of \$100,000 a year, and took life easy for a year or two.

The Jeremiahs laughed. "Charlie's all through!" they shouted. "He'll never 'come back' now." Certainly many people thought the same way, that he had reached the end of his meteoric flight in the steel world, that his business life was over.

But they were mistaken. Mr. Schwab's greatest work was to come, and his career from now on is a record of almost titanic effort.

While at the head of the great United States Steel Corporation he had bought control of the Bethlehem Steel Works, later selling out to the U. S. Shipbuilding Co., which failed. He now bought back the bankrupt Bethlehem concern and later went to Russia, where he booked an order for a whole navy.

The story of Bethlehem's upbuilding by Mr. Schwab and his fifteen young partners is an amazing one. Bethlehem Steel to-day is only second in size to the U. S. Steel Corporation and during the war its output of war material — guns, shells, shrapnel, big naval ordnance, submarines — exceeded that of the far-famed Krupp concern at Essen, Germany. At one time dur-

ing the war Bethlehem had \$400,000,000 worth of Allied orders on its books!

Nothing short of miraculous has been the amazingly swift development and expansion to giant size of this once small and bankrupt steel plant. Mr. Schwab thus explains how he accomplished this wonder:

“When I took hold of Bethlehem the second time, I selected fifteen young men right out of the mill and made them my partners. I believe in profit-sharing. Andrew Carnegie was the most successful profit-producer in this country and he gave his employees half of his profits in bonuses.

“Of the fifteen I selected, not one has proved a failure. I am proud of that and proud of them. One of them (E. G. Grace), was a crane fellow at \$75 a month. He is now earning five times as much as any other steel employee in the United States and is several times a millionaire.

“I backed Bethlehem with every dollar I had and could borrow.”

And he closed his palace on the Hudson River, and camped in the little Pennsylvania steel town, so soon to become world-famous.

It was in 1908 that Mr. Schwab plunged into the work of rebuilding Bethlehem Steel, spending practically all his time day and night at the works, punching the clock at seven or seven-thirty A. M., every day, just like any of his workmen, and staying “on the job” until late in the evening. His enthusiasm was contagious, and his men — for whom he worked out a scientific plan of profit-sharing — idolized him and

backed "Charlie," as they all called him, to the limit. Millions upon millions were spent by Schwab in improvements and in purchase of other plants, and in testing one invention alone he spent \$15,000,000. This was the Gray method of manufacturing structural steel. It was a risk, as everybody else had turned it down, but Schwab believed in taking risks, and this one turned out a huge winner, for it gave Bethlehem supremacy in steel manufacture.

And now came the most momentous event in Mr. Schwab's career, when, one day in October, 1914, after the world-war started, a messenger boy ran into his office with an S. O. S. cablegram from Commander-in-Chief Lord Kitchener urgently summoning him to a conference in London. Lord Kitchener had made Mr. Schwab's acquaintance when he visited America once, and he was, of course, familiar with the Bethlehem Works and their capabilities for supplying war-material in an emergency.

This was Schwab's opportunity — an unparalleled one; and ordering a trunk packed he lost not a moment in getting aboard the White Star liner *Olympic*, which, with full steam up, was all ready to sail for England.

Six days later, on the 27th, the *Olympic's* wireless operator got the news that close by, off the Irish coast, the great super-dreadnought *Audacious* was sinking, presumably from a U-boat's torpedo stroke. Instantly the *Olympic* changed her course, proceeding at full speed to the big British battleship's assistance. As she sunk beneath the waves, Mr. Schwab succeeded in taking a photograph of the terrible event.

After she sank, the huge liner had to remain in the vicinity for several days until permitted to continue her voyage, no one being allowed to leave the ship. Meanwhile Lord Kitchener was impatiently awaiting the steel man. Then Schwab was taken off the *Olympic* by Admiral Jellicoe and "rushed" to London into the presence of England's great fighter, Kitchener of Khartoum.

For several days England's famous warrior and the great American steel maker were in close and confidential conference. Then cable messages began to flash across the Atlantic and from that time on a period of vast and unprecedented activity set in at the Bethlehem Steel Works.

"Charlie" had captured war contracts for the British War Office up into the hundreds of millions!

The once bare-footed Loretto boy now overshadowed his old boss, Andrew Carnegie, as a steel king and master of millions.

He brushed aside, as being not worth thinking about, an offer of \$100,000,000 for his Bethlehem stock holdings.

Then Mr. Schwab returned home as fast as a great ship could travel under "rush" orders as to speed, and before long he was sending submarines, under their own steam, across to the Allies, and turning out shells at the rate of a million a month.

Not long after America entered the war, Mr. Schwab had war orders on his books amounting to half a billion dollars for the United States Government, and his

stock in Bethlehem had jumped from \$25 a share to more than \$700.

The Bethlehem concern, of which of course Mr. Schwab is the head, he being chairman of the board of directors, has now about one hundred and fifteen thousand employees and a weekly pay-roll of nearly \$3,000,000. It has branches in Chile and Cuba and owns vast shipbuilding yards.

In April, 1918, Mr. Schwab became a dollar-a-year man at Washington, where he was Director General of Shipbuilding on the U. S. Shipping Board Emergency Fleet Corporation. This was his biggest job and his smallest salary; but he patriotically plunged into his duties with his usual irresistible energy.

One of his first acts as Director General was to move construction headquarters from Washington to Philadelphia so as to be near the country's largest shipbuilding district, and as soon as Mr. Schwab started in to build ships for Uncle Sam the more than one hundred and fifty shipbuilding yards in the United States began to leap up in production. His contagious enthusiasm and strong personal magnetism had an instantaneous effect upon the ship-workers, among whom the Director General, often in shirtsleeves and overalls, used to mingle, urging the men to greater effort and encouraging them.

He made many inspiring speeches as he visited the various shipyards. At Hog Island, on one occasion, two thousand foremen crowded the hall where "Charlie" spoke. One man, after hearing him, wrote him:

“I have just got home from the Island . . . and I feel I must tell you how greatly benefited and inspired I am, after your heart-to-heart talk to us. There’s something wonderful, even mysterious, about the way you penetrate and conquer a man’s heart. . . . It cost me about \$5 in lost overtime and I had to beg my general foreman to let me off, but it just tickles me to death that I didn’t miss the opportunity of hearing you speak. You’ve pumped enough enthusiasm into me to keep me going for six months. . . .”

Mr. Schwab, in his shirtsleeves, the perspiration rolling down his face, called upon his hearers to increase the riveting record from fifty-four thousand to two hundred thousand a day by the time he came around to see them again.

“Come a month from now, Charlie,” they shouted, “and we’ll show you!”

When the *Quistconck* was launched Charlie stood at the rear of the Presidential train between two coatless shipworkers, President Wilson standing just behind on the platform, to be photographed. “I am always pleased to have my picture taken with the boys,” said Mr. Schwab, as he smiled into the camera —

“For battles are won by labor
As well as by gleaming blades,
And the riveters’ roar may avail us more
Than the splutter of cannonades.”

Mr. Schwab likes to get down among men and, by appreciation and encouragement, fill them with energy and confidence. “I do not want,” he said, “to have

any man in the shipyards working *for* me. I want them all working *with* me." In this spirit he went among them, diffusing good humor and inspiring men with his own patriotism and exhaustless energy.

Needless to say, long before the Armistice came, Charlie Schwab had satisfactorily answered the Nation's question: "Where are the ships coming from?"

When riches and fame came, one may be sure that Mr. Schwab did not forget his boyhood home, building a new Catholic Church for Loretto which cost him \$150,000. He erected another at Braddock, established an industrial school at Homestead, and he and Mrs. Schwab built a wonderful home on Staten Island, New York, for orphan and cripple children, costing \$2,000,000.

Mr. Schwab is very philanthropic and these are but a few of his many benefactions.

Music is Mr. Schwab's great hobby, and he has indulged this in his French Château on Riverside Drive, New York City, by installing a magnificent pipe-organ. This wonderful palace cost Mr. Schwab \$8,000,000, and is a dream of artistic beauty.

At his works at South Bethlehem, Pa., Mr. Schwab's workmen, thanks to his generosity, are able to enjoy good music, including the Bethlehem Steel band of one hundred and fifty pieces, in a fine music hall he built especially for their use.

These same Bethlehem Works, brought to their stupendous size and efficiency by the energy and genius of one man, constitute to-day our country's best bulwark against foreign attack — America's Gibraltar.

Charles Michael Schwab's success has been an unex-

ampled one in the world of work, and he is doubtless the world's most successful and most popular leader of industry.

ISAAC MERRITT SINGER

INVENTOR OF THE SEWING MACHINE



ISAAC MERRITT SINGER

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ISAAC MERRITT SINGER

INVENTOR OF THE SEWING MACHINE

AMERICA excels all other countries in mechanical inventions. Yankee inventiveness — mechanical ingenuity — is proverbial, and to-day American shovels, plows, reapers, tractors, clocks, watches, typewriters and locomotives, for example, have reached earth's utmost confines.

Inventions that save labor — that lessen the wear and tear on human beings — confer a benefit upon the human race. Conspicuous among such beneficent inventions is the sewing machine, justly called "America's chief contribution to civilization." Few inventions are in more general use. There are few households in the world to-day without a sewing machine. It is almost as omnipresent as the clock.

Like most great inventions, that of the sewing machine was the result of slow growth rather than inspiration. At the date when Isaac Merritt Singer's versatile brain became interested in the problem of machine sewing, it had been in process of evolution for fully a century. But the nearest approach to Singer's machine, prior to 1850, was the machine of Walter Hunt of New York City, 1832-3-4.

Hunt's brother, Adoniram F., was later hired by

George A. Arrowsmith, an enterprising blacksmith of Woodbridge, N. J., to construct some sewing machines. These machines, built by Hunt, were made and sold in New York City, and the failure of Hunt and Arrowsmith to get a patent was fraught with momentous consequences. For Elias Howe, Jr., a shrewd, wide-awake mechanic, heard of this machine, and, finding out that it had not been patented, made a trivial addition or two and patented it himself.

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With fingers weary and worn,
 With eyelids heavy and red,
 A woman sat in unwomanly rags
 Plying her needle and thread —
 Stitch! stitch! stitch!
 In poverty, hunger and dirt,
 And still, with a voice of dolorous pitch —
 Would that its tone could reach the Rich —
 She sang the "Song of the Shirt."

In a back street in Boston one midnight in August in the year 1850 two men, penniless and friendless, sat on a pile of lumber. They were both sick at heart and discouraged, for a sewing machine they had worked on long and hard wouldn't work.

One of them, the inventor, had heard from across the seas the "Song of the Shirt," and it had roused in his breast a burning desire to still its horrible refrain and carry relief and help, through his sewing-machine invention, to the weary seamstress. Golden visions of wealth came to him. But alas! his invention didn't work. The two men were dejectedly discussing the

machine's failure when his companion said to the inventor that "the loose loops of thread were all upon the upper side of the cloth."

In a flash Singer divined what the trouble was, and back through the night went the two men to the shop, re-lighted the lamp, tightened a little tension screw, and in a few minutes Isaac Merritt Singer had produced the first sewing machine that was ever practically successful.

Mr. Singer, shortly before he died, told all about how he came to make his wonderful invention. His story in his own words is as follows:

"My attention was first directed to sewing machines late in August, 1850. I then saw in Boston some Blodgett sewing machines, which Mr. Orson C. Phelps was employed to keep in running order. I had then patented a carving machine, and Phelps, I think, suggested that if I could make the sewing machine practical I should make money.

"Considering the matter over night I became satisfied I could make them practically applicable to all kinds of work, and the next day showed Phelps and George B. Zieber a rough sketch of the machine I proposed to build. It contained a table to support the cloth horizontally, instead of a feed bar from which it was suspended vertically in the Blodgett machine, a vertical presser-foot to hold the cloth, and an arm to hold the presser-foot and needle-bar over the table.

"I explained to them how the work was to be fed over the table and under the presser foot, by a wheel having short pins on its periphery, projecting through

a slot in the table, so that the work would be automatically caught, fed, and freed from the pins, in place of attaching and detaching the work to and from the baster-plate by hand, as was necessary in the Blodgett machine.

“Phelps and Zieber were satisfied that it would work. I had no money. Zieber offered forty dollars to build a model machine. Phelps offered his best endeavors to carry out my plan and make the model in his shop. If successful we were to share equally. I worked at it day and night, sleeping but three or four hours out of the twenty-four, and eating generally but once a day, as I knew I must make it for the forty dollars, or not get it at all.

“The machine was completed in eleven days. About nine o'clock in the evening we got the parts together, and tried it. It did not sew. The workmen, exhausted with almost unremitting work, pronounced it a failure, and left me one by one.

“Zieber held the lamp, and I continued to try the machine; but anxiety and incessant work had made me nervous, and I could not get tight stitches. Sick at heart, about midnight we started for our hotel. On the way we sat down on a pile of boards, and Zieber mentioned that the loose loops of thread were on the upper side of the cloth. It flashed upon me that we had forgotten to adjust the tension on the needle-thread. We went back, adjusted the tension, tried the machine, sewed five stitches perfectly, and the thread snapped. But that was enough.”

If it could sew five stitches it could sew any number!

His invention was, after all, a success! And on August 12, 1851, he got his patent.

But it is one thing to invent something, and quite another thing to sell that something. Mr. Singer was, however, confident of doing this.

Starting with a capital of \$40 borrowed from another man, this poor but clever mechanic then launched upon the stormy sea of commercial life. Discouragements and disappointments met him at every turn. People were skeptical of the sewing machine, and looked upon it much as we looked upon the Keely Motor some years back. Many such machines had been brought out but all had been miserable failures, and many people had lost their money in such ventures. All this Mr. Singer quickly learned to his sorrow when he attempted to sell his machine. Everywhere he went he found that people were unwilling to believe that a successful sewing machine had actually been invented and built, and quite often he was "shown the door" the moment he mentioned his business.

He was advised by Mr. Blodgett, who was a tailor by trade and knew more about sewing than Singer possibly could, to give up manufacturing and sell territorial rights. Blodgett further told Singer he was positive that "sewing machines would never come into use."

"Slow rises worth by poverty depressed," and poverty was this poor mechanic Singer's obstacle. He had a successful sewing machine, and a fortune from its sale in sight — but no money. He met discouragement and rebuffs on every hand, perhaps even insult, and,

in addition, he was fought by rival claimants to his invention. But he had grit and determination, and the faith of a genius in his handiwork.

The undaunted mechanic struggled on in poverty, bearing up under many reverses and disappointments, resolved to *force* an unwilling public to recognize the fact that a successful sewing machine could be and actually had been made. Slowly he gained ground; gradually he obtained access to the public ear; by degrees he induced people to at least give his machine a test. A few hundred dollars borrowed from friends expedited the work of introduction, and, just as the skies seemed to brighten, a new and formidable trouble appeared. The news that Singer had made a machine that would actually do continuous stitching brought Elias Howe, Jr., to his door with the patent he had obtained upon another man's invention (as before related), who claimed that Singer infringed his patent, and must pay him the sum of \$25,000 or quit the business. It did not take long for a man who had recently borrowed forty dollars to begin business to decline paying twenty-five thousand dollars tribute-money, and the consequence was that Singer found himself burdened with litigation that threatened to swamp him.

At this juncture he called in the aid of Mr. Edward Clark, a lawyer, whose recognized legal and financial skill were taxed to the utmost to prevent the utter ruin of the inventor. Mr. Clark became an equal partner, and business was thenceforward conducted under the firm name of "I. M. Singer & Co."

Other inventors were stimulated by Singer's success to vigorous efforts at making machines of practical utility, and the consequence was a series of infringements upon existing patents, resulting in a perfect epidemic of litigation. Principal among the litigants was this same Elias Howe, Jr., whose patent enabled him to bring all the rest under contribution, and this he did, suing right and left for several years. The patent of 1846 had made Howe complete master of the situation, enabled him to dictate the formation of a combination, by the terms of which licenses were issued to manufacturers upon the payment of a heavy royalty for each machine manufactured. From this royalty Howe received huge sums, millions of dollars, not because he had invented anything useful to the world, but simply because he had obtained a patent upon the inventions of another man!

From the outset, Singer resisted, at great expense, the demands and pretensions of Howe, fighting single-handed the battle of the inventors and the great world which was waiting for cheap machines. Howe was endeavoring to establish a monopoly, strong and compact, which meant dear machines to the weary-fingered women who were still singing the dreary "Song of the Shirt"; Singer & Co. were struggling to throw the business open to fair and honest competition at moderate prices. For three years the unequal contest was continued against the monopoly. All the other manufacturers had yielded to Howe at first, and were conducting their business without interruption under his licenses. They viewed the contest between Howe and Singer much as the tra-

ditional frontiersman's wife regarded a terrible struggle between her husband and a grizzly, merely remarking that "it didn't make such odds to her which won, but she allers loved to see a right lively fight." If Singer won, all the others would reap the full benefit of the victory without cost to themselves; if Howe should win, they would be no worse off than they were before, and he would probably cripple their most formidable competitor. Meanwhile the business of Singer & Co. was suffering every possible obstruction, while that of their competitors, now wholly uninterrupted, was making great strides.

At last, in May, 1854, self-preservation dictated a withdrawal from such a contest, and an agreement was made by which Singer & Co. were to pay Howe a royalty upon each machine manufactured by them. Thus was taken the last and most important step towards the great Sewing Machine Combination, into which Singer & Co. were the last to enter, and then only when driven into it for self-preservation, after a long and exhaustive drain upon their means.

By the year 1863, the annual sales of Singer machines amounted to twenty-one thousand, and agencies were established in the principal cities of the United States. In that year the firm was merged into an incorporated company, bearing the title of "The Singer Manufacturing Company." By 1880 annual sales had reached five hundred thousand, and to-day . . .!

It is doubtful if the history of the entire world can furnish an instance in which any single house, doing a legitimate business, has had a growth so stupendous

within an equal length of time. The reader will remember that Arrowsmith, the purchaser of Hunt's first machine, failed to patent the invention because, among other reasons, it would require "at least three thousand dollars" to begin the business of manufacturing and selling sewing machines. Little did he dream that within thirty years a single company would have millions of dollars invested in the manufacture of one form of sewing machine! Arrowsmith urged, for his fatal delay in procuring the patent to which he was then entitled, that the fees were so heavy — some \$60! And now one company spends tens of thousands of dollars annually in the various forms of advertising! Its system of agencies embraces the entire civilized world, and even pushes its outposts across the boundaries into semi-civilized lands.

On every sea are floating the Singer machines; along every road pressed by the foot of civilized man this tireless ally of the world's great sisterhood is going upon its errand of helpfulness. Its cheering tune is understood no less by the sturdy European matron than by the slender Japanese maiden; it sings as intelligibly to the flaxen-haired Russian peasant-girl as to the dark-eyed Mexican Señorita. It needs no interpreter, whether it sings amid the snows of Canada or upon the pampas of Paraguay; the Hindoo mother and the Chicago maiden are to-night making the self-same stitch; the untiring feet of Ireland's fair-skinned daughters are driving the same treadle with the tiny understandings of China's tawny daughter; and thus American machines, American brains, and American money are bringing

the women of the whole world into one universal kinship and sisterhood.

Were Singer alive to-day he would be lost in amazement to see what a giant oak has grown up from his original little acorn. He had the poor seamstress, "with fingers weary and worn," mostly in mind when he toiled, starving meanwhile, upon his epoch-making invention. He probably never dreamed, for one thing, that his sewing machine would be developed into one for a vast variety of manufacturing purposes.

At the present time more than two thousand five hundred varieties of Singer's invention are in use in industry driven by steam, electricity, etc. And a large force of experts is constantly at work inventing new types for new processes of manufacture.

It is said that the late war could not have carried on without the sewing machine, for it is essential to the manufacture of more than one hundred and seventy distinct objects.

Merit is the only ladder to success in the Singer concern. Both the present president, Douglas Alexander, and his predecessor, the late Frederick G. Bourne, started with the company as office-boys, and rose to the top through sheer merit.

Such is the story of the sewing machine from its paltry and inauspicious beginning. Such were the struggles and trials of the indomitable soul to whose genius the world owes the vast, incalculable and forever accumulating benefits of this great invention.

LOUIS FRANKLIN SWIFT
HEAD OF THE WORLD'S LARGEST
MEAT-PACKING BUSINESS



LOUIS FRANKLIN SWIFT

LOUIS FRANKLIN SWIFT

HEAD OF THE WORLD'S LARGEST MEAT-PACKING BUSINESS

A HALF a century ago there lived at West Sandwich, Cape Cod, Massachusetts, a youth, whose savings from work on the farm were eighteen dollars. That was not much of a capital on which to begin business, but to the youth in question it was enough, so he drew it from its place of safety and invested it in a heifer. Now it was Widow O'Leary's cow who kicked over the lantern that started the great Chicago fire, but it was Gustavus F. Swift's heifer that started that young man in the butchering business that was destined to grow into one of Chicago's — and one of the world's — greatest industries. So do great oaks from little acorns grow.

Mr. Swift was the original "thrift" man, and when a boy at West Sandwich, started in to save his profits and put them back into his business. Young Swift, though a butcher's boy and then a butcher on his own account, started life with a good education, well ingrained habits of industry, plain living and the fear of God. His father was a farmer and his first American ancestor, William Swift, emigrated to this country in 1630, settling in Sandwich, Massachusetts. Both

he and his immediate descendants played their part in the constructive building of the Commonwealth of Massachusetts and, later on, in the federation of the Thirteen Colonies into the United States.

Young Gustavus was an unusually bright and very active lad, and was soon advanced and quickly mastered all the details of the retail meat business. It was a business he liked, and in course of time he became ambitious to have a butcher-store of his own. He had begun to have glimpses of wonderful possibilities. He dreamed of "big things" and wanted to be his own boss.

After some years of hard work and no play, he managed to accumulate a small capital, and opened a retail butcher shop at Barnstable, Massachusetts. This to many people no doubt looked like a wild venture for so young a man; but he was successful from the start and branched out into the buying and selling of live-stock in a small way between farmers and butchers in his local territory. Gradually he extended his operations to the then live-stock centers, Brighton and Watertown, on the outskirts of Boston.

In 1872 the alert and enterprising Gustavus formed a partnership with James A. Hathaway, buying and selling live-stock, with headquarters in Albany, New York. Hathaway & Swift were successful from the start and Gustavus F. Swift became noted for his keenness, foresight, and energy, and was regarded as an authority on live-stock matters.

With the phenomenal growth of the West and its constantly increasing live-stock development, an active

live-stock market had grown up at Chicago, which was rapidly making itself felt as a live-stock center. Being thoroughly alive to this growth, the firm of Hathaway & Swift, in 1875, opened an office in Chicago and later moved their business and concentrated their entire efforts at this point. Soon after locating on the shores of Lake Michigan, Mr. Swift began to slaughter cattle on his own account at Chicago, and, in the fall of 1875, began shipping dressed beef to the Eastern markets. Previously, all live-stock destined for Eastern markets, the then principal consuming territory, was shipped alive on the hoof and slaughtered in local slaughtering centers in the consuming territory.

It was about this time, however, that a novel and revolutionary device — the refrigerator car — was put into practical use, and, while Mr. Swift was not the inventor, he was among the first to use the idea and had as much to do with the development of this dressed-beef business as any one else in the trade. This idea revolutionized the meat industry, for to slaughter the cattle at some central point near its origin, paying freight on only dressed beef, was an economic advantage not to be overlooked. Why pay freight on so much of the animal that was uneatable?

In 1878 the firm of Hathaway & Swift was dissolved and a new firm organized which was called Swift Bros. & Co., being an association of Gustavus F. and his brother, Edwin C. Swift. This new firm continued the business with increasing success. In the meantime the slaughtering activities of Gustavus F. Swift had also continued to be very successful, and, with its

growth, Mr. Swift determined to incorporate the business. So in 1885, Swift & Company was incorporated with a capital of \$300,000 and Mr. Swift elected president thereof.

The phenomenal growth of the business is a record in itself, and additional cash was put in from time to time to meet successively the demands for new and enlarged facilities, so that in a few years the business that was started with a capital of \$300,000 and one thousand six hundred employees, doing a slaughtering business in a few small buildings, has grown to a company with a capitalization of \$150,000,000, with over 60,000 employees, and with sales in excess of \$1,200,000,000 a year!

Gustavus Swift was a pioneer who blazed the trail for one of the gigantic industries of the age. He was a very shrewd, level-headed, far-seeing man — a business genius of unusual caliber.

An honest and sincere man, of few words but of quick and effective action, he was a member of the Methodist Church, and a firm believer in the Christian faith.

In his business he was a great educator. A model of industry and business efficiency himself, he was constantly endeavoring to develop a similar efficiency among his many employees. While his criticism at times tended to be severe, it was helpful, for his only intention was to make better and bigger men of those with whom he was associated in daily work.

When Gustavus Swift died in 1903, the vast business of Swift & Company fell to the charge of Louis, the eldest of the eight surviving children out of eleven.

In the old fable we read how the dying man called his six sons to his bedside and told them to go to the forest and each bring back a stick of wood. When they returned each with his stick, he told them to make a fagot of them. This they also did.

“Now, take the fagot,” he said, “each of you, one after the other, beginning with the oldest, and try to break it across your knees.”

They tried, one after the other, down to the youngest, but not one of them could even bend, let alone break, the six tied sticks. No result followed their strenuous tugging and straining.

“Now, untie the fagot,” said the dying man, “and each of you take his stick, and then try.”

The six boys each took his stick, and each instantly broke it across his knee.

The dying man smiled. “Now,” he went on, “you will understand my parting advice, my sons. Stick together! For, as you have seen, in *union* there is strength!”

It is this idea that has been the guiding principle of the Swifts. They have held together. Each, when old enough, has entered the business, and, beginning at the lowest rung, has, without favoritism, gone through all departments and mounted to an executive position. Thus, one is in charge of beef and mutton, one of pork, another of soaps, still another of branch houses, and yet another of the New England district, and so on.

Each started in at the bottom, first putting in four months in the stock-yards, under a cattle buyer, then

another four months with a hog buyer, and so on, until every branch of the business had been covered.

Louis, now the head of the family, was born at Sagamore, Cape Cod, Massachusetts, on September 27, 1861. When his parents moved to Chicago, about 1875, Louis attended the Graham Grammar School and Englewood High School, but, inheriting his father's intense energy and love of work, the boy proved too impatient to send to college. He wanted instead to go to work at once in his father's big packing plant. So to work he went, beginning at the foot of the ladder and working his way up through every department of the business, and growing with it.

When his father died there was no one better fitted than Louis to succeed him as President of the world's largest meat-packing business — an organization owned by more than twenty-five thousand shareholders and making its profits on such a small margin as fractions of cents per pound of meat sold.

Louis had worked hard, devoting his whole time and attention to the business, studying it in every detail, and letting nothing in the way of an economy or improvement escape his attention. He had frittered away no time in "society" or in expensive time-wasting amusements, fads or hobbies. Work was his hobby. So, not merely because he was the eldest son, but because he was best fitted to wear it, did his father's mantle fall upon him.

"The big boss," Louis F. is called, for he is big, broad and tall — over six feet. He is fond of horses and of golf, but has very little time to devote to either.

At his work usually at 8 A. M. and at night, when all his employees have gone home, he and his brothers are usually to be found at their desks.

Louis F. Swift, like his father who gave so much money to Northwestern University, is also philanthropic, but, as he is a very reticent man, no one knows much about his charities. He likes to be "let alone" and keeps as silent as to his good deeds as he does about his business.

He is a member of the Society of Mayflower Descendants, and of a number of leading clubs; but he is quiet, modest and democratic and wholly absorbed in his business, which, under his leadership, has shown its most rapid growth and expansion.

One of Mr. Swift's beliefs is that every one — particularly young men — should be in debt. He urges every one of the more than forty thousand employees of Swift & Company to get into debt and to keep in debt, and he has organized a system to encourage them in this and to show them how to do it profitably.

"If the debt is for something of intrinsic value, it is worth while," he says. "As soon as one thing is paid for, buy something else and get in debt again. Stay in debt and never get out. Just as long as the debt is not for clothes or drinks or such things, but is for something of real, tangible value,— a house or a bond, for example,— it is worth saving for and it is worth while.

"Save — save something, no matter how little. Get one hundred dollars in hand, get one thousand dollars — you will find the second hundred or second thousand

will come much more easily than the first did. The start is the thing!"

May 19, 1919, Mr. Swift announced a "1919 Employees Stock Savings Plan" whereby employees are given the right to purchase stock at par by going in debt for it.

In addition to this plan Swift & Company has an Employees' Stock Investment plan for purchasing stock at the market value and extending the payments over a period of two years. This plan has now been in operation for more than fifteen years.

Love of country has been strongly inculcated in the children of Louis F. Swift, and four of his five living children were in active service during the great war. Mrs. Bessie (Swift) Fernal went to France before America entered the war, and, when our first detachment of marines was landed, established a canteen just behind the lines so that she might serve them with such few little necessities and luxuries as she could get together. Later she entered the hospital at Neuilly sur Seine, Paris, as a nurse, and for more than a year gave her devoted attention to the wounded, returning to this country in April, 1919.

Alden B. Swift was for a time in charge of a Red Cross warehouse in France and returned to this country to enlist in a Motor Truck Division. He was in this service when the armistice was signed.

Louis F. Swift, Jr., saw service in France as a First Lieutenant in the Artillery Division.

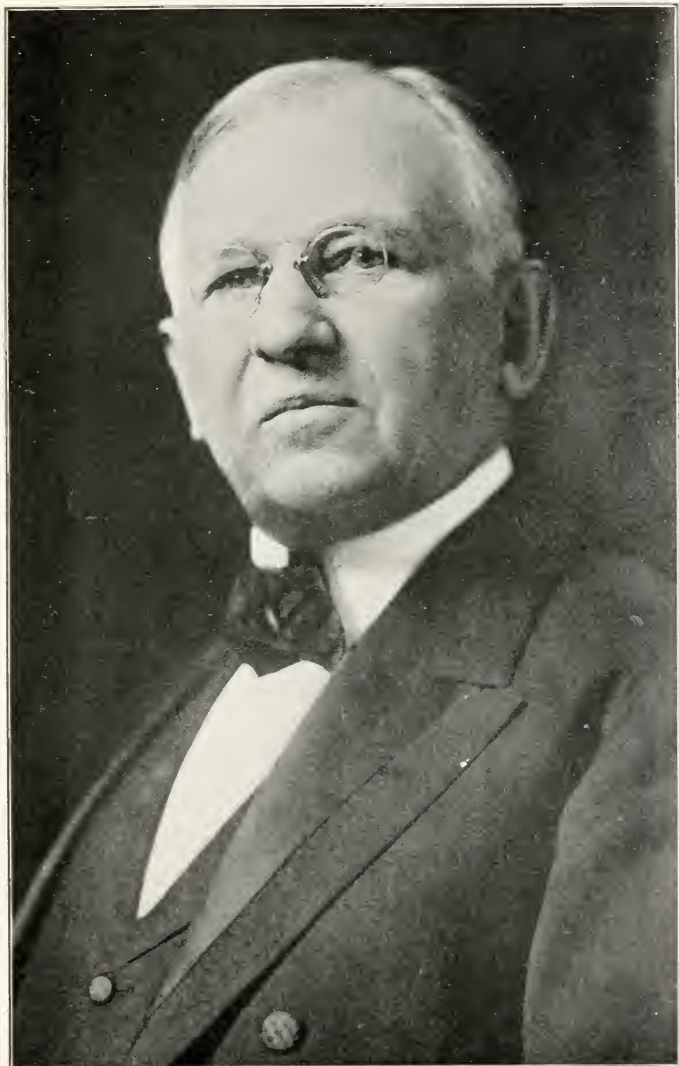
William E. Swift enlisted in the Naval Aviation Corps, returning from the Orient so that he might enter

the service, and was in training when the war ended.

Mr. Swift himself, during the great conflict, gave his services untiringly to the business of preparing meat foods in sufficient supply so that no man in service, and no man, woman or child of the civilian population, might go hungry, and few of our leaders of industry worked harder than he during the long gray days of the war.

JOHN WANAMAKER

**AMERICA'S FOREMOST RETAIL MERCHANT
AND ORIGINATOR OF THE DEPART-
MENT STORE**



JOHN WANAMAKER

THE NEW YORK
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JOHN WANAMAKER

AMERICA'S FOREMOST RETAIL MERCHANT AND ORIGINATOR OF THE DEPART- MENT STORE

ON a certain Christmas eve more than sixty years ago a country boy, his clothes besprinkled with snow, walked into a Philadelphia jewelry store to buy a present for his mother. He had saved a few dollars from his earnings and was glad to find a pretty trinket within his slender means.

"I'll take that," he said, handing out the cash a bit proudly.

As he spoke he saw another shiny something that pleased him more, even though it was higher in price.

"I think I'll change my mind and take this one instead," he said to the man, who had not yet wrapped the first selection.

"It's too late now," snapped the jeweler. "You've bought this and you must keep it."

Doubtless it had been in stock a long time, and, under customs which then governed business, the boy had no recourse. He took what he did not want and said nothing — nothing audible!

But then and there he determined to start some day a store of his own where no one would have to stand such unfair treatment.

This boy was John Wanamaker, who later on, in his little clothing store in Philadelphia, was the first merchant to install the "money back on your purchase" system.

One might enter to-day, any time between the hours of eight o'clock in the morning and six or seven at night, the private offices in the Wanamaker Building in Philadelphia and find there, hard at work, a genial-faced, robust man of apparently sixty-odd years, whose hair has only just begun to turn gray.

This man is John Wanamaker.

He has stopped counting his years, and he seems to have stopped growing old, but he was born before railroads in this country had made much progress; before the time of the perfected telegraph and telephone; the electric light; the wireless; the typewriter and even the steam-printing press.

His store was the first store ever lighted by electricity, and this event happened the night after Christmas, 1878. In 1909 flying machines were on sale in his immense emporium.

John Wanamaker, America's greatest retail merchant, was born on July 11, 1838, in the southern part of Philadelphia, when there were few houses in that section. His father, Nelson, was a brick-maker, his grandfather, John, a plain farmer, and the family originally came to America about the time of the landing of William Penn, the founder of Pennsylvania. His mother's ancestors, who came over about the same time, were French Huguenots.

John's father being a brick-maker, the boy's first work

was "turning bricks" and doing odd jobs around the yard. He was the oldest of seven children, and, as his parents were poor, he had to leave school early in his boyhood days to earn a living for himself.

He was fourteen when he obtained his first employment as errand boy in the publishing house of Troutman & Hayes, on Market Street, at a salary of \$1.25 a week.

After a while his family moved to Kosciusko County, Indiana, but returned to Philadelphia in 1856, when John obtained a position in the retail clothing store of Barelay Lippincott at \$1.50 a week.

Then he entered journalism for a brief space, publishing a small paper called *Everybody's Journal*, finally taking a position, at higher wages than he had yet received, with Col. Joseph M. Bennett, proprietor of the Tower Hall Clothing Store, at that time the largest business of the kind in the city. About this period in his career the young man began to put personality into his work, with the result that customers at "Tower Hall" began to ask — when they came into the store — "Where is John?" and insist that he, and no one else, wait upon them. He had pleasant, courteous manners, and character, and every one had confidence in the young, tall and good-looking salesman and liked him. His customers rapidly increased, his acquaintance too, and he gained his employer's confidence and esteem. He succeeded, because he liked his work, and put his whole heart and soul into it.

Colonel Bennett delighted in telling his friends that "John is the most ambitious boy I ever saw. I used

to take him to lunch with me and he would tell me how he was going to be a great merchant. He was always organizing something. He seemed to be a natural-born organizer. This faculty is probably accountable for his great success."

He had great perseverance and tenacity. A schoolmate said of John Wanamaker that, when any difficult problem in arithmetic was to be solved, it was the rule to remain after school hours, and sometimes the master would become weary in trying to solve it; but John was not so easily discouraged; he would keep the master in until he was satisfied with the result. In this way he distanced all the other pupils. While he attended school, little time was afforded him for play like other boys, as he worked in his father's brick-yard "turning up" the bricks.

This close application in one so young caused him to grow up tall and thin, and his faithful attention to his new employments told severely on his general health, causing his friends to think that he was going into a decline, and, at the suggestion of his physician, in 1858, he started for Minnesota.

His health improving, he returned to Philadelphia the same year, when he was elected the first salaried secretary of the Young Men's Christian Association in America, which organization was then in its infancy. He was one of the first members of the Philadelphia Association, and afterwards the chairman of the International Committee.

One Sunday, while passing the Chambers Presbyterian Church, at the corner of Broad and Sansom

Streets, before he went West Mr. Wanamaker heard singing, and entering the church was much impressed with the services, especially with the preaching of the paster, Rev. Dr. John Chambers. At the conclusion of the services he went up to Doctor Chambers and introduced himself. The clergyman was so pleased with the young stranger that after a long conversation he insisted on young Wanamaker joining his church and Sunday-school. John always thereafter took an active part in Sunday-school work, and when but eighteen years of age enjoyed quite a reputation as a speaker in religious meetings both in the Chambers Church and elsewhere.

By 1861 the thrifty John had succeeded in saving \$1,900, and then he came to the momentous decision to go into business for himself with his friend, Nathan Brown, whose sister he married about this time. So, on April 2, 1861, the youthful firm of Wanamaker & Brown took possession of a building at Sixth and Market Streets, on the site of what was once George Washington's home, and where also once lived Robert Morris, the great financier of the Revolution, who once entertained Count Rochambeau there. Some other occupants of this historic house were the British General, Lord Howe, and, it is said, Benedict Arnold.

The store was opened for business at six o'clock in the morning on Monday, April 8, ninety-four hours before Fort Sumter was cannonaded by the Confederate General Beauregard.

The first day's sales amounted to \$24.67, of which sum all but the sixty-seven cents was immediately spent in advertising, in which Mr. Wanamaker has always

been a firm believer. The first year's sales reached \$24,367, and the hustling young merchant didn't disdain to deliver goods himself in a wheelbarrow sometimes.

On the outbreak of the Civil War, however, young Wanamaker sought to enlist in the army, but was rejected on account of the weak condition of his lungs. Then with George H. Stuart, James Grant and others, he organized the great Christian Commission, which went hand in hand with the Sanitary Commission, and was so efficient in aiding the sick and wounded soldiers, on both sides, until the close of the war.

The first eight years of Mr. Wanamaker's enterprise was marked by that same spirit of application to which he had accustomed himself from early youth and he lost not a day from business in all that time. His energy and unceasing attention to the details of the business caused it to grow with much rapidity, until it developed into what was admitted to be the largest retail clothing establishment in America. In 1865 he inaugurated the strictly "one price" system, and its success led many other merchants to follow in the same line.

In 1875, Mr. Wanamaker bought the old freight station of the Pennsylvania Railroad at Market and Thirteenth Streets, and it was quite an event in Philadelphia when the "Grand Depot" was opened on May 6, 1876, a date almost coinciding with the opening of the Centennial Exposition. In course of time the whole block was gradually absorbed, creating the most interesting as well as the largest retail store in America.

In September, 1896, the famous A. T. Stewart Store on Broadway from Ninth to Tenth Streets, New York, was added to this gigantic business enterprise, and in September, 1897, a fourteen-story building erected by Mr. Wanamaker on Broadway, Eighth and Ninth Streets, was opened to the public with a demonstration which was participated in by prominent men from all parts of the country, including the Secretary of the Treasury.

The old freight depot in the Thirteenth and Market Streets block, Philadelphia, has entirely disappeared, and on its site now stands a twelve-story granite structure with three floors beneath the street surface. An army of more than twelve thousand employees is connected with these great stores.

In 1912 this store was completed, and dedicated by President Taft in the presence of a notable assemblage of distinguished visitors, including members of the diplomatic corps, Senators, Representatives and Governors.

Mr. Wanamaker was the originator and organizer of this mercantile achievement.

John Wanamaker, a pioneer in big advertising, reduced it to a science. Perhaps more than any one man in the United States John Wanamaker succeeded in establishing the value of honest statements to the reading public. He frowned upon "brag" and "bluster" and set the pattern for great merchants throughout the country. He translated white paper into money that came across his counter and this translation was achieved through his intimate knowledge of just what

he had to sell and his remarkable ability of making store news interesting.

In 1914 he introduced into his business establishments the Saturday full holiday for his employes — during July and August — which has been largely followed by progressive merchants.

He owns one of the finest art collections in the country, though some of his gems were lost in a fire which burned Lindenhurst, his country home near Jenkintown, in 1907. On the seventh floor of his store is a private art gallery, in which are two colossal paintings epitomizing the life-work of Mihaly Munkacsy, "Christ Before Pilate" and "The Crucifixion." No price has ever been placed upon these masterpieces. Often the great merchant remains in this impressive room half an hour or more, gathering inspiration for his daily tasks.

He is a firm believer in real estate as an investment, and owns valuable plots in and near his native city.

Mr. Wanamaker's wondrous energy is shown in a nose prominent and eyes clear, characterized by frequent flashes. His jaws are well-formed and strong, and his face always is clean shaven, as smooth as a boy's, as mobile as an actor's, and when lighted in the warmth of discussion beams with expression. He is almost six feet tall and finely built. Nobody ever saw him dressed in any other color than black or dark gray, with a plain black necktie under a turn-down collar. His face has ever upon it an expression of geniality, of warm-hearted amiability. Ever quick and spry in his actions, no one can be in his presence without catch-

ing something of the spirit of his wide-awake, all-per-vading energy.

In 1900, while a prominent clergyman was visiting Mr. Wanamaker at his store, two girls, detected in shop-lifting, were brought into the private office. The goods had been found on them, and while they admitted their guilt, they were defiant and refused to reveal their names. At Mr. Wanamaker's suggestion both men knelt in prayer, which so moved the culprits that they broke down, cried and confessed, saying they were strangers in the city. Instead of sending them to prison, Mr. Wanamaker had them taken to the house of a Christian woman, and gave them employment in his store. This is an example of his wonderful spiritual influence and philanthropic activity.

Mr. Wanamaker has always had a purpose paramount to profits in business, and he may be said to have revolutionized the retail trade by his inauguration of shorter business days, one-price system, profit-sharing, pension funds, etc.

He has always been very public-spirited. He once financed an expedition to Alaska, and while Postmaster General introduced many reforms into the service.

In 1912 Mr. Wanamaker received the decoration of an officer in the Legion of Honor from the French Government. Two degrees of LL.D. have been conferred on him, one by Howard University, the other by Ursinus College, University of Pennsylvania.

He has erected Y. M. C. A. buildings in India, China, Korea, and in 1914 sent two relief ships to Belgium.

He is a typical example of the self-educated American

who has climbed the ladder from the first rung to the top. He has wonderful powers of concentration, and is a good listener as well as a good talker.

In his New York office you will see a chair used for many years by John Hancock; a desk of James Madison's; and on his walls are hung old-time prints of Abraham Lincoln, Stephen Girard, Robert Morris, George Washington and other great Americans. In his Philadelphia office, opposite his desk there always looks down upon him from the canvas the familiar features of Benjamin Harrison, his intimate friend, with whom he served the American public for four years as Postmaster General.

Working six days a week, Mr. Wanamaker has never been content to rest the seventh, and every Sunday one can find him, even now, at Bethany Church in Philadelphia, which he founded over fifty years ago, and which has the largest Sunday-school in the world, reaching a membership of almost six thousand.

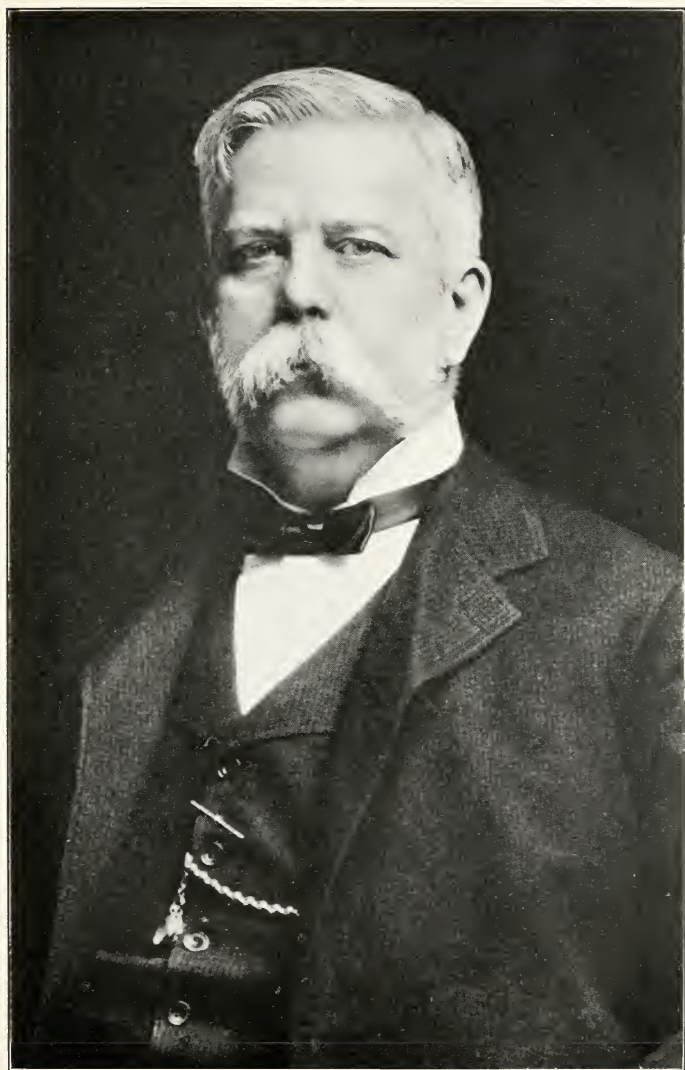
Mr. Wanamaker has really given his great life to two things — to his wonderful business which has been not only a path-finder in commercial ethics, but also an industrial community that supports in its various ramifications at least sixty-five thousand people; and to his church and Sunday-school. Into each of these he has woven his wonderful personality.

It has been said that he might have been President of the United States had he been content to go along with the machine methods of the day. But Mr. Wanamaker has always stood for the highest type of government, as he stands for the highest type of business, and

although he has made many fights for reform in his home city and home State, he has been content to remain a soldier in the ranks, leaving the rewards to others.

GEORGE WESTINGHOUSE

INVENTOR OF THE RAILROAD AIR-BRAKE



GEORGE WESTINGHOUSE



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INVENTOR OF THE RAILROAD AIR-BRAKE

“**B**IFF! Bang! Crash!” It was a head-on collision, and nothing remained of the two “freights” but a heap of wreckage — a mass of junk. The engineers had seen the signals, but before the hand-brakes could be applied, the collision came.

A young man, whose train was held up by the wreck, stood, hands in pocket, gazing at the ruin. He was thinking. Then he remarked to one of the train hands:

“This wreck wouldn’t have happened if the engineers could have controlled the trains from their cabs!”

“Control how?”

“By braking them.”

“Why, yes,” responded the man, slowly grasping the idea, “they’d have had plenty of time!”

When the line was clear, the young man continued his journey, but there had been planted in his mind a great idea — the idea of the automatic brake for railroad trains. A very crude idea it was to begin with, and he had to reject first one and then another attempt to design a workable brake. A mechanical automatic brake wouldn’t work, and he realized that he had to have some kind of motive power; so he tried steam. But that wouldn’t work. His problem seemed insol-

uble, but in his spare time he continued tinkering with his brake at his father's machine-shop at Schenectady, New York.

Then Dame Fortune took a hand in shaping this young man's career.

It was the noon hour of an intensely hot August day at the Westinghouse Agricultural Works at Schenectady. The machinery was still, everybody was at lunch, and the few clerks in the office were well nigh prostrated by the heat — for it was the hottest day in years.

At one of the desks, however, sat a young man whom no heat, however intense, or cold either, seemed to affect. A living dynamo, his tremendous energy, persistence and concentration of mind rendered him oblivious of weather or other conditions. His name was George Westinghouse, and he was soon to become one of the world's greatest inventors.

George Westinghouse had a passion for work along inventive lines, and on this particular day he was as usual devoting his dinner hour to working on his brake idea in his father's office.

So absorbed in his plans did he become, that for awhile he didn't hear Dame Fortune — in the guise of a little girl — whispering at his elbow.

"You'll take one, won't you?" pleaded, almost tearfully, a childish voice.

"Take what?" he asked, still mostly absorbed in his drawings. He hadn't heard a word about what she had previously said.

"This magazine," the girl replied, holding it out to

him. "You know, I'm spending my vacation getting subscriptions for it."

George was a good-natured young fellow, and, like most men of genius, without a particle of stinginess in his make-up.

"All right," he said, putting down the money, "leave the magazine on the desk."

The little girl laid the book down, thanked him and went on her way. Almost immediately George was as much absorbed in his work as ever and had forgotten the incident.

Trivial as the incident was, however, it resulted in momentous consequences to the world.

That evening when George went home he thrust the magazine into his pocket and forgot all about it until bedtime when he took off his coat and saw it sticking out of his pocket.

Taking it out he glanced rapidly over it. Suddenly something riveted his attention. It was a short item describing the building of the Mont Cenis tunnel, in the Swiss Alps, and stating how compressed air was being used as motive power for drills.

In a flash George Westinghouse saw the solution of his brake problem and, sitting down, he made a rough sketch of the first air-brake.

Strange to say, George's father had no confidence in any of his son's "wild schemes," as he called his youthful inventions, and he declined to take up the manufacture of any of them. So George decided to manufacture them himself, and went about trying to raise capital for that purpose. He at last succeeded in getting

two men to put up \$5,000 each for the building of the plant at Schenectady, they to have a two-thirds interest. He was to give his services and patent-rights for his third. He was shrewd enough, however, to reserve to himself the patents themselves.

A quarrel over this soon arose and Westinghouse was "frozen out" of the business. Without his energy, initiative and genius it could not, however, go on, and soon came to an untimely end.

The young man, though only twenty years old, had recently married, and in the serious predicament in which he now found himself, his warmest encouragement and best advice came from his young wife. A few days later he was in Pittsburgh, having made an arrangement with the steel-casting firm of Alexander & Woods to employ him as salesman, they to have the right to manufacture his re-railing device, one of his inventions. This was in the spring of 1868.

From then on the career of young George Westinghouse developed with a rapidity that was as astounding as it was dazzling.

In 1869 the Westinghouse Air-Brake Company was organized, with George Westinghouse as its president and general manager, and by 1871 his resistless energy had led to the adoption of his air-brake by most American railroads. The same year he went abroad with his wife, and succeeded in getting his invention adopted there, and after his return home Congress passed a law making the use of the Westinghouse air-brake by railroads compulsory.

When George Westinghouse died in 1914, at the

age of sixty-eight, he was the president of more than thirty large corporations, the owner of thousands of patents, and a multi-millionaire.

George Westinghouse was born at Central Bridge, Schoharie county, New York, on October 6, 1846, his father having moved there from Vermont. George Westinghouse, Sr., an inventor of more than usual ability, had patented the first threshing-machine in America, and in 1856, when George, junior, was ten years old, moved to Schenectady, New York, where he organized the Westinghouse Agricultural Works, to manufacture his machines.

When the boy George was not at school, one could be sure of finding him in one of his father's machine shops, where he loved to tinker around and "make things." From an early age he showed a most unusual aptitude for things mechanical, and before he was fourteen had invented the rotary engine.

When the Civil War came, George, only fifteen, determined to enter the U. S. Navy. So he tried for the examinations, passed, and was assigned to an assistant engineer's post. Later he enlisted in the 12th New York National Guard, afterwards changing to the cavalry, and finally closing his war record as engineer on the U. S. gunboats *Muscoota* and *Stars and Stripes*.

After the battle of Gettysburg he went to college for a couple of years, and then returned to his old job in his father's factory.

The boy had a perfect passion for mechanics. Born with a wonderful inventive genius and great fondness and capacity for work, he had in addition to these

valuable qualities, herculean size and strength, together with an adamantine will.

After his invention of the air-brake, as related, all these qualities were heavily drawn upon. He took his air-brake invention to first one railroad manager and then to another, but for a long time he was unable to interest a single soul in it. No one had confidence in the "boy's" invention. To stop a train by *air*, seemed absurd on the face of it.

One of the great American railroad chiefs he managed to secure an interview with was Commodore Vanderbilt of the New York Central Railroad. Every obstacle was put in George Westinghouse's way to prevent this interview. But at last he reached the presence of the railroad king. The old Commodore listened silently to his earnest and eloquent description of his invention, and, when the young man stopped talking, said:

"So you think you can stop a New York Central train going at full speed by wind, do you? — Well, young man, I've no time to waste on darn fools — good morning!"

His reception elsewhere was not unlike this one. But these rebuffs did not dishearten the young inventor, in fact only nerved him and strengthened his determination, for he knew the value of his brake — knew it would work. At last he got in touch with three Pittsburgh gentlemen — Mr. Carnegie, Mr. Pitcairn and Mr. Bagley — and it was arranged between them to equip one train with the Westinghouse air-brake attachment, and thus give the invention a practical test.

In October, 1868, the test was made with a train of one engine and four coaches on a track between Pittsburgh and Steubenville.

Luck favored young Westinghouse, for, in the middle of the run, a farmer's wagon got on the track, at a sharp bend. Hand brakes would have been useless in such a sudden emergency. The engineer threw on the air-brakes, and a collision was prevented by a margin of only a foot or two. So suddenly was the train stopped, that everybody in it was thrown flat.

After this and other highly successful tests, "Crazy George," as he was often called, was on top of the heap, and hailed as one of the world's greatest benefactors.

He was soon traveling about in one of the most luxurious and up-to-date private cars ever constructed, completely equipped as a business office and study, and then he built his palace at Lenox, in the Berkshires, known as Erskine Park, where he entertained some of the world's greatest inventors and scientists.

Within a few years the companies he controlled were employing not far from a hundred thousand workmen, whom he treated so fairly that there was never a strike of any importance at any of his works.

Mr. Westinghouse was always "at home" to the countless hundreds of inventors who came to him with their ideas. Sometimes he got hold of something valuable, but often the idea proved valueless. He had a perfect mania, or genius, for experimentation and investigation, and electricity soon attracted him. With his usual irresistible energy he plunged into its study

and in 1893 succeeded in getting the contract to light the Chicago World's Fair.

Two French inventors discovered the use and economy of the alternating electric current. Mr. Westinghouse, with his usual acumen and enterprise, went to Paris to see them and bought the patents. He then applied the new system in the United States, with the aid of his own inventions, throughout the whole field of the electrical industry. It proved a revolutionary invention for the Westinghouse companies.

He then turned his attention to the electrification of railroads, for it was his opinion, and he often stated it, that the steam locomotive had reached its capacity, and that universal running of trains by electricity was close at hand.

Here again his foresight proved wonderfully correct. Some of the heaviest locomotives in the world to-day are driven by electricity.

Some one said once that George Westinghouse's air-brake had saved more lives than were lost by Napoleon in all his wars. He has, too, added to the rapidity of railroad travel, for without air-brakes trains couldn't travel at more than half the speed they do.

In addition to his air-brake, electrical and other inventions Mr. Westinghouse was the first man to harness natural gas to industry. By so doing he more than doubles the manufacturing capacity of the Middle West. It was through his wife he became interested in natural gas. Mrs. Westinghouse, with a clever woman's intuition, was sure there must be some in the back garden of their Pittsburgh residence.

Mr. Westinghouse was amused, and asked her if she was willing to spend \$5,000 in sinking a well.

"It'll cost, all of that," he said.

"Yes, let's try it," his wife replied.

Down and down and down and down went the drill until it seemed as if it must be about the center of the earth. Still there was no gas! Then suddenly, unexpectedly, the gas came with a gush that threatened to sweep the house away. But the flow did not last long, and soon the well petered out — went dry. The experiment was, nevertheless, a tremendously successful one, for it led eventually to the use on a huge scale of natural gas as a fuel in manufacturing, thanks to George Westinghouse's experiments and inventions.

It has often been said that he was the possessor of Aladdin's wonderful lamp. At his will, almost in the twinkling of an eye, vast Westinghouse factories sprang up, not only in America and Canada, but in England and Europe.

But, as a matter of fact, his success was built upon the same old formula — an idea, and perseverance enough to develop it.

George Westinghouse was a man of ideas, and his determination — stick-to-it-iveness — enabled him to develop them. Gifted with extraordinary mechanical genius, and wonderful organizing ability, he was, in addition, a far-seeing, broad-minded man, with a brain peculiarly receptive to suggestions. In this respect it somewhat resembled a lightning-conductor, so rapidly did it absorb ideas.

Before he died he had the satisfaction of seeing his

air-brake in universal use the world over; of being made an honorary member of learned societies, and of receiving decorations and orders from foreign governments.

George Westinghouse was easily one of the greatest men in his century, and one of the world's foremost leaders of industry.

JOHN NORTH WILLYS
WIZARD OF AUTOS AND AIRPLANES





JOHN NORTH WILLYS

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JOHN NORTH WILLYS

WIZARD OF AUTOS AND AIRPLANES

FEW leaders in American industry have been so splendidly successful as John North Willys, the "Auto Wizard" of Toledo, Ohio. The dramatic scenes in his life flash by with the rapidity almost of motion pictures, and constitute a romance of automobile selling and manufacturing without a parallel.

In 1890, when only seventeen, a small storekeeper in a country town in New York State, to-day he is a millionaire.

Well has John North Willys been called the "Auto Wizard"!

Mr. Willys is young — much younger than most men who have achieved as much as he, but has crowded many years of hustle into his life. He is one of our great army of young Americans who achieve big things without any "drag," without any pull, and with no one to push him. He needs no one to do that, as he is all "push." He has the ability to do things in the right way and with the most productive results. He has business and financial genius.

It was in the small country town of Canandaigua, New York, where his father was a brick-and-tile manufacturer, that the hero of this brief chronicle was born on October 25, 1873. When old enough Johnnie went to

the public school and did so well that his father wanted to send him to college. But the boy didn't relish the idea of going to the university, for he was boiling over with energy and enthusiasm for a business life — and millions!

He had already done some business on his own account before he was sixteen and it came about in this way. He wanted a bicycle, and, as his parents couldn't afford it, bicycles costing then a hundred dollars, Johnny set forth after school and in different ways earned money enough to buy a sample New Mail Bicycle, taking the agency for Canandaigua and thereby getting the dealer's discount.

This started him as a bicycle agent doing his selling after school hours. At seventeen years of age he was a business man!

Later, after getting through school, he opened a bicycle store and repair shop in Canandaigua. This brought him in touch with the Eclipse Bicycle at Elmira, N. Y., and he became a salesman for that company. Later, with the money he had saved, he established in Elmira the Elmira Arms Company and dealt in bicycles and sporting goods, first as a retailer then as a wholesale distributor. Before he was twenty-five he had built up a business of \$500,000 a year.

Then came quite a violent turn upward of Fortune's wheel for the youthful bicycle dealer.

One day in Cleveland he saw for the first time a horseless vehicle — a vehicle that was self-propelled. A great idea seized him, and for \$900 he bought a Pierce Motorette to use as a sample, for he determined

to sell motors as well as bicycles. He saw big money in it. But although he gave endless demonstrations in and around Elmira he sold only two the first year. The third year he succeeded in selling twenty, and after that he took more orders than the manufacturer could fill.

Mr. Willys almost at a glance came to the conclusion that there was a fortune in making automobiles, but he hadn't enough capital. So as a first step, before beginning manufacturing, he formed a large selling company, as he had done with bicycles, to take the entire output of one or two companies. He conceived the idea of securing the entire United States agency for the Overland car, which was manufactured by the Overland Automobile Co. owned by D. M. Parry of the Parry Mfg. Co., of Indianapolis. He went to that city to close this deal and was told that he was crazy to undertake such a thing.

"What's your objection to giving me the sole United States agency?" demanded Willys.

"Young man," the president retorted, sternly, thinking to crush Willys in one sentence, "do you realize that we want to manufacture *five hundred automobiles the coming year?*"

(Mr. Willys makes more than that every forenoon today.)

"Suppose I agree to take all of your five hundred cars — and pay you for those I cannot sell?" said Willys.

"You wouldn't be so foolish," answered the automobile manufacturer.

“Bring on a contract and see a foolish young man sign it,” laughed Willys, and he did.

It was an iron-clad contract binding him to pay for five hundred automobiles every year. Mr. Willys went back to Elmira, and then set out on a tour of the country. He established many agencies and was succeeding so well that, from a Western town, he wired the manufacturers in Indianapolis: “Need more than five hundred cars to fill orders. How fast can you turn them out?”

It was a bright morning full of hope for him when he sent that wire. He had visions of joy in that Indianapolis office when they got his wire. But when the reply came it knocked the sunshine out of that day quicker than a wink. The wire reply was:

“Take no more orders. Cannot fill those on hand.”

It was a bad fix he was in then, when one takes into consideration the fact that this was in 1907 — the year of the big panic when actual cash couldn't be had. Young Willys was up against a mighty stiff proposition.

Big concerns were failing right and left, and other big concerns were tottering. Those that were not tottering were so badly frightened that they wouldn't invest two dollars in a five-dollar gold piece, they were so suspicious. Mr. Willys took his message from the Overland concern of Indianapolis to his little room in that Western town hotel and sat down. He propped it up in front of him and got busy. He didn't shed a tear or wring his hands. He did ring for writing materials and got busy setting down tall columns of figures. He knew more about the manufacture of an automobile

than most of the officials of the company that gave him the United States agency. When he had finished figuring he made the next train for Indianapolis.

“The failure of that company meant the loss of my income, it meant that I must start all over again but, worst of all, it meant that I must break my promise to several hundred customers who expected me to deliver cars,” Mr. Willys once said, touching briefly upon his “dark day.”

“What’s the meaning of this?” he demanded of the manager of the company when he reached Indianapolis late on Saturday.

The manager shrugged his shoulders. He had stopped fighting several days before.

“We are going into bankruptcy Monday morning,” he said.

“We are not!” exclaimed Mr. Willys.

“We?” queried the manager with a sardonic smile.

“You bet. I can’t afford to have you do this —”

“We are out of funds. We paid many of our employees in checks to-day and there isn’t money enough to cover in the bank. Of course they will be preferred creditors —”

“How much cash do you need to pay these men — and keep them?”

“Only \$350,” was the manager’s answer. Mr. Willys stoutly asserted that he would raise it. The manager said he was dreaming, that there wasn’t that much ready cash in seven States, and a lot of other discouraging things. But Mr. Willys went to the hotel clerk and asked for \$350. The clerk’s answer was quite

to the point, "What's the answer? I'll bite." It took some talking and Willys' personal check to convince the clerk that he was in earnest. The proprietor of the hotel, learning that Willys wanted this money to pay a group of Indianapolis workmen, ordered the clerk to cash no more checks and to hold on to every coin and bill from the hotel, restaurant, bar, cigar-counter and other source of revenue. By Monday morning the proprietor dumped a big stack of coins and small bills into a valise and handed it to Mr. Willys, who got it into the bank in time to pay the workmen.

"But why this generosity? You are not one of the company!" queried the surprised manager.

"I'm going to be," declared Willys decisively with a cheerful smile, and then followed some of the tallest hustling for funds that ever occurred in the history of automobiles, either in panicky or good times.

Story writers would not dare to create a "hero" who forged ahead as rapidly as did Mr. Willys, or who did big things on nothing but brains and hustle, because the writer's critics would say that the story was not only improbable but impossible. Yet it all happened in fact. At that time the Overland automobile concern in Indianapolis had a "factory" made of sheet iron, 80x300 feet, filled with much-worn machinery. When Mr. Willys reached that city and hustled up enough cash over Sunday to pay the men the following Monday, the firm's liabilities were \$80,000 and its assets about \$8,000 in machinery and a few automobile parts.

Even in good times few investors would care much

for such a proposition, and in such times as the 1907 panic the suggestion that Mr. Willys or any one else could raise money enough to tide the firm over seemed wildly impossible. Mr. Willys had but little money himself. He rushed to Chicago, he wired close friends, he raked and scraped, and finally he got enough cash to keep the concern going one more week, then enough to keep it going five more weeks, at the same time standing off a bunch of decidedly clamorous creditors. By good financiering he managed to stand off those \$80,000 worth of creditors with \$3,500 cash. He counted in his orders for cars as assets, which made \$25,000, he took all the stock he could buy in the company he had saved, and urged the men to work harder to fill orders. Then he went out on the road again and got a heap more orders, so many that a tent had to be bought from a stranded circus to accommodate the overflow output.

The company was safe and prospering now, with Mr. Willys at the helm, but in too crowded quarters. So he looked around for a new site for his plant, and he bought the Pope-Toledo plant in Toledo. He merged it into the Overland and changed the name to Willys-Overland Company. It was worth \$1,500,000. He got it for \$375,000. His circus-tent days were over. He had a real plant now, but he continued to enlarge it, until it now covers a hundred and fifty acres of floor space. He started other plants. To-day he has six plants turning out, at top speed, his seven varieties of cars.

In the early days, while every one was "automobile mad," the people were not at all satisfied with the

one-cylinder affairs. Mr. Willys knew this. He proposed to give the people what they wanted. He built up his giant business on four cylinders — that is, he added three more cylinders to a car of popular price and then had to keep about as big a staff at work enlarging his plant as worked on his cars.

On a certain day in December, 1916, quite a little family party called on Mr. Willys at his Toledo home. It was made up of five thousand Overland dealers and another five thousand of their "folks." For seventeen days they pranced around Toledo and got acquainted with Mr. Willys and his plant and his cars, from "Nothing on the floor" to a complete car. Eight years before that Mr. Willys did not know one of these men, nor had one of them heard of Willys. Quite recently he told something of that "visit," and of the growth of his industry that made it possible:

"They came from all parts of the country, in seven miles of Pullmans. They learned that we were big, but also that we were human — they found that their rich relatives were not a bad sort after all.

"In 1909 we took over the big Pope-Toledo plant, but it wasn't big enough for us. Our first year at Indianapolis saw us turn out four hundred and sixty-five cars. By 1910 this output had grown to almost four times that. In 1917 it was one hundred and forty thousand. Nine years ago we had two hundred and fifty employees. Now we have above twenty thousand.

"Naturally I wanted my salespeople to come and get acquainted — and they came, like schoolboys, bubbling with fun and keen for business. They saw every-

thing there was to see, ate beefsteak dinners and witnessed the best minstrel show I ever saw in my life — all made up of our own talent.”

Mr. Willys' mention of the minstrel show gives a hint of how very human he is. He gets on with people because he is sociable, because he is democratic. He is, too, of a sanguine, optimistic temperament and ardently devoted to outdoor sports, for he is a strong believer in the old adage: “All work and no play makes Jack a dull boy.” This is why he got such a good baseball team for Toledo.

“He looks like forty, he acts like thirty — and he works like sixty,” said one of the officials of Mr. Willys' company. “He's down to his office before the office boy and he sets a pace difficult to follow.”

Mr. Willys is dynamic, blue-eyed, possesses a pleasant smile, is slightly gray and can cover more territory to-day than his youngest, liveliest salesman.

Before the war and before he started in to do his bit for Uncle Sam, Mr. Willys' daily schedule was something like this:

Reach office eight A. M.

Complete inspection of plant eight-thirty.

Get through important mail nine-thirty.

Meet callers by appointment until one P. M.

Office conference until two.

After that hour he frequently has private interests, family interests, a bit of rest, some golf, more than likely a trip to some gathering and speechmaking.

Mr. Willys has a charming wife and daughter and a wonderful residence in Toledo. The family spend their

summers on the Massachusetts coast. If he has any hobby at all outside of manufacturing a good automobile, it is art. About four years ago he bought the great old painter Rembrandt's famous "Pilgrim at Prayer." He owns many famous old masters and probably possesses the finest private art gallery in the West.

Quite naturally he believes in good roads. A few years ago he believed \$150,000 worth in them, giving that sum toward the building of the Lincoln highway from New York to San Francisco, which plan of linking the two oceans by an improved highway he believes only the first step toward what is going to be the greatest engineering undertaking of the age. He says that good roads do much for the automobile industry, but that the automobile industry has done ten times more in creating good roads.

It wasn't more than six years after he organized the Overland Company that he was offered \$80,000,000 for his share of the company!

That is considered, in the industrial world to-day, as "some organizing." It is little wonder that when he offered the powers at Washington to do his bit, some one said "He's a great organizer!" Another, "He's a great hustler." And they certainly sized him up correctly.

Right on top of his tremendous success as an automobile manufacturer, Mr. Willys entered the field of aëronautics, becoming the head of the Curtiss Airplane & Motor Company of Buffalo, N. Y.

For more than twenty years Willys and Curtiss had been friends, but it had never entered into Mr. Willys'

head to add airship-making to motor-car making, until Mr. Curtiss told him his company needed a practical business man to run it. This was just before the United States entered the war. Mr. Willys, with his usual foresight, felt sure the nation was on the brink of declaring hostilities against Germany and her allies, and foresaw how the Curtiss company would do a big business in supplying our Government with its product. It seemed a patriotic duty to go to the assistance of such a vitally necessary industry in view of the nearness of war.

Mr. Curtiss wanted to devote his whole time to invention — to the working out of his ideas and plans in connection with airplanes and seaplanes, so he urged his old friend Willys to take the Curtiss Company's helm, and so relieve him of business and financial worries.

It was in this way that John North Willys became the president of the huge Curtiss Airplane Company and, after war broke out, he certainly made things hum. In one year he supplied our Navy with more than four hundred seaplanes, and was turning out airplanes at the rate of five hundred a month.

He is a great organizer — a great executive — that's why.

John North Willys is a good type of the hustling American with plenty of horse-sense.

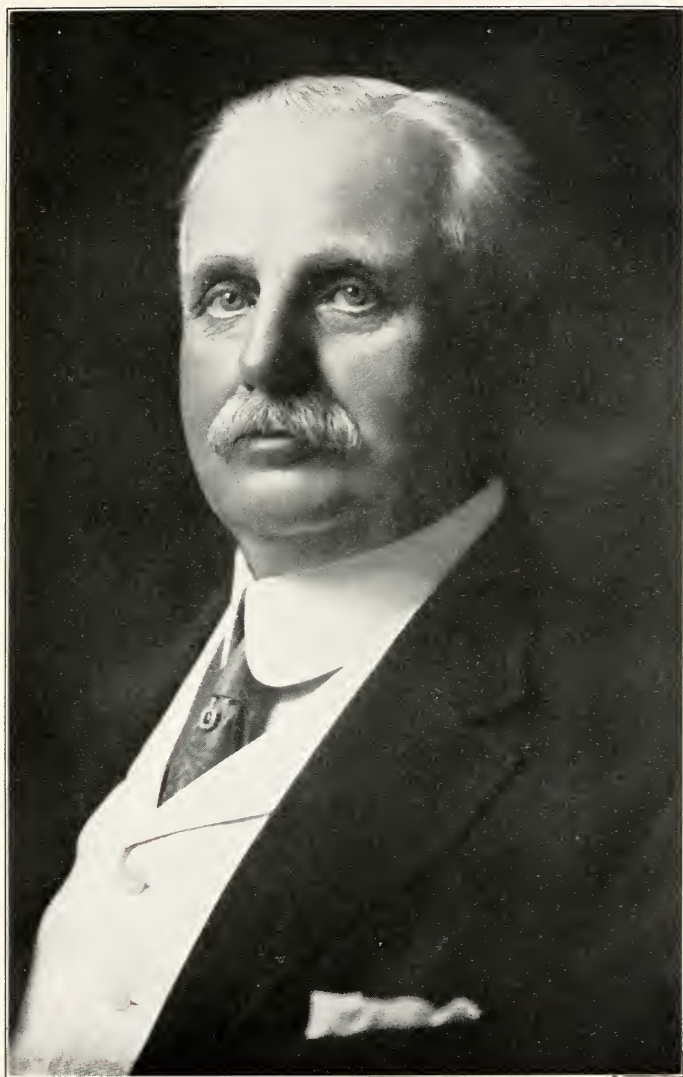
He got some valuable business experience in his youthful days when he was running his bicycle store in Canandaigua, and where he sold his goods mostly on credit, under the impression that everybody was

honest. "It was the best business lesson I ever had," he relates, "as it opened my eyes to the stern realities of business and taught me judgment and good horse-sense."

Since then he has succeeded in everything he has undertaken, and to-day is one of America's largest employers of labor, and one of the world's greatest industrial captains.

FRANK W. WOOLWORTH

MAGICIAN OF THE 5 AND 10 CENT STORE



FRANK W. WOOLWORTH

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MAGICIAN OF THE 5 AND 10 CENT STORE

THE ability to see an opportunity when it comes along and make the most of it is not of course given to every boy. But there are boys — and men, too — who couldn't recognize an opportunity, even if it were as big as a haystack. There was a farmer's boy in New York State whose parents were so poor that he had to go barefooted half the year and, during the winters, no matter how severe they were, had to go about without any overcoat.

Under such hard conditions it is no wonder the boy came more and more to dislike the farm, on which he did every kind of work, and left it before he was sixteen to seek his fortune in the world of business.

This boy lived to build on Broadway, New York City, the tallest building in the world — a cathedral of commerce costing all told about \$12,000,000 — and to see the tiny business he founded upon his "5-cent idea" grow to one thousand thirty-eight stores doing a business of nearly \$110,000,000 annually.

This boy was Frank W. Woolworth, who died in 1919, leaving a fortune of \$70,000,000, including the magnificent Woolworth Building, America's highest beacon of commerce, and several fine residences.

Frank Woolworth was seven years old when his par-

ents moved from Rodman, New York, where the boy was born on April 12, 1852, to Great Bend in the same State. His parents and ancestors for many generations were Methodists, and he was brought up very strictly. Like the boy Rockefeller, Frank Woolworth more than once got a whipping "on account" for some as yet uncommitted transgression. As a boy he had to toe the line pretty hard. His youth was not a "soft" one.

His father was a farmer and the boy's life was a hard, dreary round of humdrum farm duties. There was nothing he did not do in the farm-work line. It was all work and no play. He was glad when the winters came and he could go to school, so he could play during recess. But he never learned to skate, because no one ever gave him a pair of skates and of course he had no money to buy any. Skates were luxuries far out of his reach.

He made the most of his opportunities at school, picking up knowledge as rapidly as any other boy, and joining in all kinds of games and sports. He was a healthy, normal lad, though thin.

As he grew up his farm work became more and more irksome, and the ambition formed in him of being a railroad engineer — or merchant. He loved to play, with his younger brother, at keeping shop, and would ransack the house for articles to stock his counter — the family dining-table. His parents rather encouraged him in his idea of becoming a clerk in a store, for they were satisfied that he would never be happy as a farmer, for his heart was not in the work. He had become fascinated by the idea of "selling goods," and

the young fellow who sold things in the village store "was the object of my supreme envy," he once said.

At sixteen he was beginning to get some idea of what he wanted to do for a living some day. So he left the public school and for two winters, at a commercial school at Watertown, laid the foundation of a good knowledge of accounts and business usages.

After this necessary grounding in the science of accounts, the boy felt ready to make his plunge into business. So one freezing morning bright and early Frank Woolworth hitched the old mare to a cutter and drove to Carthage, where he doggedly drove from store to store seeking a job. He was turned down with scant ceremony all along the line, for nobody wanted an ill-dressed, raw, awkward country boy. But when he went home, "jobless," he was more determined than ever to get into a store, for a trader's instinct was rapidly developing in him. The rebuffs only strengthened his resolution, for he had the right stuff in him. He was gritty.

At Great Bend, where the family lived, there was a railroad station — a small country railroad depot — and Frank, deciding that he'd have to get started, somehow, offered his services, without pay, to the station-master, who kept a small grocery store in the rear of a freight shed. He decided to work for nothing in order to get experience in selling and handling goods. In this way he became assistant station-master, without pay, and started in selling goods and tickets, making out reports, and doing such other simple clerical work as came his way.

While working at the depot Frank made quite a number of acquaintances, and this is something that every young man ought to do. The larger his circle of friends, the better chance there is for him to get on in the world.

While working at the depot he never relaxed his efforts to get into a regular store, and he turned down an offer from an uncle of \$18 a month, with board and lodging, to work on his farm, for he was now fixed in his determination to be a merchant.

He had a good friend in Daniel McNeil, who ran the big general store at Great Bend, and who promised to try to find him a job in Watertown. Frank, almost twenty-one, yet not earning a dollar, was becoming impatient over his future and used to see Mr. McNeil every night to see if he had any news. After a long, weary suspense, Mr. McNeil at last told him a man named Augsburg in Watertown was willing to see him and look him over.

You may be sure that Frank lost no time in reaching Watertown and getting together with Augsburg & Moore, drygoods merchants. He naturally expected a small salary to start with, but the firm had an idea that he ought to "pay for tuition" while learning the business. This did not seem quite fair to Frank. However they "split the difference" by agreeing to give him \$3 a week, after three months' work for nothing, and to raise his salary fifty cents a week every six months thereafter. During the three months he worked for nothing all he lived on was \$50 — his savings for ten years!

“Leaving my father and mother to strike out in the world and tackle an uncertainty,” said Mr. Woolworth once, “was the hardest experience of my whole life.”

On a bitterly cold day in March, 1873, with three feet of snow on the ground, the young man left home for Watertown, his father, who was taking a load of potatoes there, driving him over.

“As the sleigh drove away I could see my mother standing at the door, and she stood there as long as I was in sight. Her letters to me during the early years of my struggle to make good were the most beautiful, the most inspiring, any mother ever wrote to her boy.”

When the boy reached Watertown and hunted up Mr. Augsbury, who was sick at home, he said:

“Hello, Bub! — Say, Bub, don’t they wear collars or ties up where you live?”

As a matter of fact they didn’t, so poor “Bub” had to make deep inroads into his small savings getting collars and ties and replacing his flannel with white shirts. A haircut completed his metamorphosis from a “hayseed” — a “rube” — into a citified store clerk.

It was quite a time after starting to work for Augsbury & Moore (afterwards Moore & Smith) of Watertown before Frank Woolworth, in the opinion of his bosses, amounted to anything. A raw country boy, he was naturally slow and awkward at first. He could never find the goods a customer asked for, or remember the price, or make out a sales check. For a long time he was permitted to wait upon customers only during

the noon hour. All the drudgery was his to do, and the clerks turned their noses up at him because he was only a farmer's boy, and ridiculed his awkward attempts to sell goods.

His hours of work — and interminably long they seemed — were from 7 A. M. to 10 P. M.

His progress was indeed slow. After five years of the hardest kind of work, his salary, at the age of twenty-six, was only \$6.00 a week! No wonder he jumped at what he thought was an opportunity. For, hearing of a vacancy in the store of a man named Bushnell, he applied for it, asking \$10.00 a week. To his surprise, Bushnell said: "All right, when will you commence?"

On this big salary he felt justified in getting married.

But alas! in a couple of months Bushnell cut his pay down to \$8, finding fault with his ability as a salesman and because he trimmed the windows. "I want you to sell goods — nothing else!" he snarled.

This blame for poor business and the cut in pay had a serious affect upon young Woolworth. He became despondent, and worried to such an extent that he was stricken down with nervous prostration. He also contracted a fever. He nearly died, back there at the farm, and in his year-long sickness his mother greatly comforted him. She never lost faith in him. "Some day, my son, you'll be a rich man," was her comforting assurance.

When he had fully recovered a man came along who was so anxious to sell his four-acre farm that he offered

it to him for \$900. Woolworth had no money, but nevertheless, by raising \$600 on mortgage and giving his note for \$300, he grabbed the opportunity.

He raised chickens and potatoes and anything and everything that would bring in a dollar, his wife helping him in his farming. And you may be sure it was a terrible struggle to make both ends meet.

After four months, to his surprise, his old employers Moore & Smith sent for him and offered him \$10 a week to come back and "tone up" the store. Woolworth was greatly elated and his confidence in himself returned. For, since he had started out in the world of work to earn his living, this was practically the first recognition he had received of the value of his services anywhere. He had put a tremendous lot of hard work into the years he had been at Moore & Smith's, and, as it seemed to him, they at last appreciated his devotion to their interests.

So young Woolworth went back to his old job, his wife remaining on the farm until later on when he rented a three-room home in Watertown.

In one year he had saved \$50, in addition to loaning his father — who was very hard up — \$20 and paying the doctor's bill, for at this time his first baby was born.

It was on February 22, 1879, that Frank Woolworth started his first five-cent store in Utica, N. Y., and how he came to do this is the most interesting story of his marvelous career, for it hinges upon an *idea* — the idea upon which he built up one of the greatest businesses and fortunes of modern times.

This was the 5 and 10 cent stores idea, and this is how it originated:

On a certain hot day in August, 1878, Mr. Moore said to young Woolworth: "What more can you do to earn your salary?"

Trade was a bit dull!

"Well," replied Woolworth, after a moment's reflection, "I'd like to try to sell some of the goods around this store that people have been slow in buying. Give me a table and a little space and I think I can work out an idea."

"Go ahead!" was Mr. Moore's crisp reply.

The only thing available was a small sewing machine table. On this young Woolworth arranged some of the shop-worn goods, and stuck up a sign:

Any Article on this counter 5 cents.

The goods went like hot cakes — nearly every article was sold the first day.

And this was the beginning of the idea of selling an assortment of goods at a uniformly low price.

Young Woolworth continued selling five-cent goods for Mr. Moore and their popularity in Watertown grew steadily. Then he induced Mr. Moore to trust him with \$300 in five-cent goods to start a five-cent store of his own in Utica.

The young merchant did very well for a time, but the variety of articles he could sell at five cents was small and as soon as people had supplied themselves with mirrors, nail files, etc., his custom fell off, and he was at his wit's end. Where to get new and different articles to sell at five cents was his knotty problem.

His business at last petered out, so packing the remainder of his goods he flitted to Lancaster, Pa., where he succeeded in getting further financial backing, and where his store was a success from the start.

In a very little while Frank W. Woolworth was the sole survivor in the 5-cent-store field, all his rivals, one by one, had given up. They lacked what Woolworth had — grit, persistence, boldness, and originality of ideas. Soon after opening at Lancaster he manifested his boldness, his courage, by opening a branch at Harrisburg, where he put in his brother, C. S. Woolworth, as manager. He dropped this venture after a while, but he was now satisfied beyond doubt that he had found his business — his life work. He was certain of success.

By the summer of 1880 he was worth \$2000. "I felt so rich," Mr. Woolworth once related, "that I decided to take the first vacation I had ever enjoyed."

Revisiting Watertown the successful young merchant received a great reception. The once green and gawky country lad was now a solid and prosperous business man, with more money in his purse than almost anybody in the town had ever seen in their lives.

Returning to Lancaster, Woolworth now decided to fix his brother up in some way. So, after some study of the field, he sent him to take charge of a five and ten cent store at Scranton. (His brother is now a millionaire.)

Philadelphia was next invaded by Woolworth, but after three months he closed the store, for it was un-

profitable, and opened one in partnership with his cousin S. H. Knox, in Reading. When Mr. Knox died a few years ago he, too, was a multi-millionaire.

In spite of the failure of three out of five of his five and ten cent stores Woolworth was undaunted. His courage never waned, for he knew he had got hold of the right idea. He visioned a chain of successful stores country wide, and he lived to see his dream more than come true. He had some hard sledding occasionally, but from the time he opened successfully in Harrisburg, there were few halts, or setbacks, in his whirlwind career. "Excelsior" (Upward and Onward), the motto of his home State, New York, might well have been his own battle-cry.

But before any really big success came, young Woolworth had many things to learn. When, for example, he opened a store in New York, he worked day and night. He was his own bookkeeper, salesman, buyer and everything else. After an attack of typhoid fever, which laid him up for eight weeks, he had the conceit knocked out of him that he could do everything — buy, sell, keep books, etc.— more efficiently than any of his associates. He learned to leave details to others, and to occupy his mind only with the larger affairs of the business as a whole. Many business men who insist upon attending to every detail of their business themselves — who won't trust others — remain in one little store all their lives, and never know prosperity.

Woolworth early learned this lesson of coöperation, and from then on he succeeded enormously. Not only did he trust his employees to do lots of things he himself

used to insist upon doing, but he made a point of having a partner in each of his stores.

His idea was that business is like a snowball, "One man can easily push it along for a while but soon the snowball gets so large that if it is to be pushed ahead, help must be obtained to roll it — and if you don't keep on rolling it, it will soon melt."

Another secret of Woolworth's success was the reputation he gained of giving "value for value." Then again he dealt only in articles of "universal demand." He didn't attempt to sell Siamese elephants, for few people, even if wealthy, would care to have one for a pet. Rather he sold candy, nursing bottles, hairpins. Of handkerchiefs, for example, he sold, in 1918, fifty-four million!

Early in his career, when he was dashing ahead so fast that many of his associates thought him crazy, he grasped another secret of success — that the more of any single article you can buy at one time the cheaper you can get it. He once saw a finger ring, which had been manufactured to retail at 50 cents. Said Woolworth to the manufacturer:

"I want that ring at a price that will let me sell it — at a profit — for ten cents."

The manufacturer laughed consumedly — thought it a mighty good joke. How many did he want? A hundred dozen, perhaps?

"I want a thousand gross!" was Woolworth's reply. Impossible! Absurd! Couldn't be done! He could never make the ring to retail at ten cents.

Nonetheless the factory was soon working overtime in

their effort to supply the Woolworth stores with rings to sell at ten cents! Woolworth used sixty thousand *dozen* in one year!

In 1918, to many people's amusement, Woolworth invaded the highest-priced shopping district in the world — Fifth Avenue — with one of his 10-cent stores. It has been strikingly successful, above forty-five thousand people entering the shop the first day of its opening.

Woolworth's active, constructive work has had a marked beneficial effect upon American manufacturing. His expert buyers have often actually not only been able to show manufacturers how to increase their efficiency and output, but how to manufacture lots of things formerly bought from abroad. He taught them how to make, for example, celluloid dolls and Christmas tree ornaments. Even before the war eighty-seven and one-half per cent. of the merchandise he bought was "made in U. S. A."

The coöperation with the maker of goods has resulted in a large development and expansion in this country's manufacturing industries traceable to Woolworth methods.

There are thirty-five thousand regular employees in the Woolworth stores — mostly girls. After being with Woolworth one year each employee gets a cash bonus at Christmas, and when a girl of three or more years of service leaves to get married she received a substantial cash wedding present.

Woolworth made no mistake when he determined to bring so many of the commonest necessities of life within reach of the masses. But his vast business was

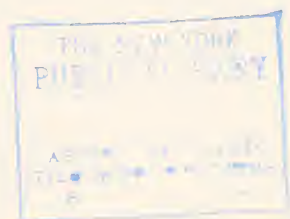
established on business, not philanthropic, principles. He sold nothing that he did not make profit on. He sold nothing that was not universally used.

Out of little came much. The tiny acorn became a mighty oak. From his chain of stores, in the United States, Canada and Great Britain, with their more than a half billion customers annually, came a golden harvest of nickels and dimes. He enriched himself, and enriched many others, and, as a lasting monument to his extraordinary energy and business enterprise, sturdy American qualities of industry and plucky endurance, the Woolworth Building and other Woolworth enterprises, stand to-day his best memorial.

ORVILLE AND WILBUR WRIGHT
WHO ACHIEVED IMMORTAL FAME AS
AIRSHIP INVENTORS



WILBUR WRIGHT



ORVILLE AND WILBUR WRIGHT

WHO ACHIEVED IMMORTAL FAME AS AIRSHIP INVENTORS

A VERY ingenious but quite simple toy led to one of the most startling and revolutionary inventions in the history of the world.

Out in Ohio lived a good bishop, known as Bishop Milton Wright, of the United Brethren Church. He was an educated, clever man, otherwise he would never have become a bishop. Passing a toy-shop one day, he became greatly interested in a little contrivance in the window labeled "flying-machine." The toy had a Greek name — helicopter, or something like that — and was driven by twisted rubber bands, which, as they untwisted, turned a couple of cardboard propellers. He remembered his little boys at home, so went in and bought one.

It was in 1878 when Bishop Wright brought home this miniature bamboo and cork airship, and, holding it concealed in his hand, to excite his sons' curiosity, suddenly threw it up in the air, where, of course, instead of falling, it began slowly and gracefully to fly.

The boys voted it the greatest thing in the toy line they had ever seen, and they never got tired watching its simply wonderful flights through the air. Having no pilot aboard, the ship seldom flew in a straight line,

but this only made it the more interesting, for its gyrations in the air were erratic and quite extraordinary.

The toy, long after it fell to pieces, lingered vividly in the boys' memories, and whenever they saw a bird sailing through the sky they remembered their "bat," as they had christened their helicopter, which, by the way, was invented by a Frenchman after losing the use of his limbs through hip disease.

The boys had inherited mechanical genius through their mother, and, from an early age, had had a knack of making and inventing things. So a few years later the two boys — Wilbur and Orville Wright — put in all their spare time constructing toy flying-machines somewhat resembling their "bat," only larger. "To our amazement," the brothers once related, "we found that the larger the 'bat' the less it would fly! We didn't know then that doubling the linear dimensions of a machine calls for a motor *eight times more powerful.*"

For the time being the brothers stopped experimenting with airships — for they had to earn their bread and butter — and began to manufacture bicycles, with a safety-brake of their own invention. They had no great success in this business, however, only about managing to hold their own.

In 1896, when Lilienthal was dashed to death from his flying-machine, the news made a great impression upon the Wright brothers, and they now began to seriously study aëronautics. They first tackled Chanute's book, then Langley's and devoured endless articles and treatises on the subject. They even sent to Europe for Lilienthal's book, for he had

evolved, seemingly, the best, yet simplest, ideas. "Whoever would conquer the air," he declared, "must imitate the bird's dexterity — must fly and fall, and fall and fly, until he can fly without falling." They also studied Mouillard's "Empire of the Air," and read all the *aéronautic* magazines.

Out of their intense, thorough study of *aéronautics* grew the conviction that airships built upon the then current principles could have no practical value. So they began to experiment and at last to make flying-machines based upon their own theories.

In 1900, having at last constructed a ship to their satisfaction, the brothers spent their vacation in North Carolina, where their first experimental flight was made one momentous October day at Kitty Hawk. No operator was aboard their machine, for they flew it like a kite, testing equilibrium, etc., by means of cords which they controlled from the ground.

The results were tremendously encouraging, and in the summer of 1901 Mr. Chanute spent several weeks with the Wrights at their testing camp near Kitty Hawk, offering suggestions and advice from time to time as he watched the evolutions of their ship. The more they experimented the more numerous and complex grew the problems that had to be solved before success was theirs, and what the young men had started in to do, more for amusement than anything else, now loomed up as something formidably scientific. They were under the necessity of studying air, air-currents, wind-pressures and velocities, the reciprocal effects of superposed surfaces, etc., but all these and other mys-

teries of aviation, instead of daunting, fascinated the brothers and encouraged them all the more to master the secrets of aërial navigation.

So on they went with their experiments, in the fall of 1902 making about a thousand ground flights — short hops, grasshopper fashion, along the ground.

By this time everybody was smiling at “the Wright boys.” They were called “visionaries,” even “nuts,” and a very learned man proved conclusively, by mathematics, that no heavier-than-air machine could support itself in air, much less fly!

But the Wright brothers went calmly, deliberately, scientifically ahead, thoroughly testing, before adopting, any part or device used in their plane. They tested the efficiency of their steering-gear, the sustaining capacity of their wings, and then they designed and started in to construct a practicable plane driven by a motor. When they came to add propellers, however, another scientific problem faced them — screw propulsion. They could get no tables from naval engineers, so their first propellers were constructed on a “dead reckoning” basis. Notwithstanding they got a third more power than either Maxim or Langley had obtained.

At last arrived the great day! The greatest day in the lives of these two indomitable, persevering souls, and one of the greatest day in the history of American invention.

It was on the 17th of December, 1903, that Wilbur Wright (now dead) climbed into his motor-aëroplane, turned on the power, and *flew!* His glide lasted but

twelve seconds, but, since the world began, it was the first time a machine carrying a man had arisen of its own power, described a circle in the air and finally descended safely to earth.

Up to this time the brothers had conducted their experiments far from the madding crowd, in a spot where their only visitors were the "mocking" birds that flew inquisitively over them. They now determined to give a demonstration at their busy home, Dayton, and in the spring of 1904 a flight was attempted in the presence of a large crowd, including newspaper men — all very skeptical.

By this time the inventors had a heavier and stronger machine; but on the first day of the great public demonstration there wasn't wind enough to lift the plane, and all it did was to bump along the ground a little way. Another trial, the next day, was also unsuccessful, for the motor went wrong. Some slight defect developed, and it wouldn't go.

There arose also new problems of equilibrium to solve, so the brothers had to do some more private experimenting.

Finally, in September, 1905, the brothers succeeded in making a long flight. At a height of about a hundred feet they sped six miles and back in the air.

The two Dayton boys had won! In less than five years these two plucky and courageous American boys had solved the problem of navigating the air — had succeeded where countless other aëronautical pioneers the world over had failed.

Tremendous excitement followed this feat, and the

crowds to see the airmen were so great that the Wrights had to continue their flights in a quieter place.

About now their money gave out, for their bicycle business, having been neglected for some time, was bringing them in nothing. So, although they had perfected their airplane, they had no funds for further flights or experiments. But the young men had a good friend in their sister Katherine. She had saved some money from her salary as school-teacher, was devoted to Orville and Wilbur, and had full faith in their invention. She placed all her savings at the disposal of the young aviators, so they could continue exhibiting their machine and experimenting.

It was a solemn, impressive moment in the lives of the Wright boys when, having thoroughly demonstrated the practicability of their airship, a realization of what their wonderful discovery meant to their country and to the world burst over them. As in a vision, they foresaw all the marvelous possibilities of aërial navigation. And they were awestricken!

They had called a spirit "from the vasty deep," so to speak, and it had come at their bidding. What should they do with this newly-acquired and potentially terrible discovery which enabled them, at will, to leave the earth and *fly* immense distances at immense heights?

It was a solemn and awesome moment when the young men pondered these things, and they determined to call a family council. So the two brothers, their father and sister gathered one day in the parlor of their modest dwelling, and all fell on their knees and prayed to God for guidance. The prayer over, good old Bishop

Wright, his face wet with tears of joy and thankfulness, arose, and then the family decided that they must offer the invention to their country. Being essentially religious, godfearing people and intensely patriotic, their country was their first thought. No thought of commercial gain entered into their minds.

So the brothers wrote to Washington, to the War Department, to the effect that they had constructed an aëroplane that would navigate the air, and offered the invention to the United States.

The letter was pigeon-holed!

The Wrights were very poor people. They could not afford to go to the Capital and present the claims of their epoch-making invention in person. So they wrote to Washington again. Then they received a somewhat curt refusal to consider the proposition, adding that they had no time to send a board to Ohio to examine into the claims of "a couple of cranks."

And this was how the United States Government let still another great American invention slip through its fingers.

The Wrights were deeply chagrined, and, as their money was nearly exhausted, the outlook was black — for them and their invention. But, fortunately, there was in New York City a man who had a vision.

This man was Charles R. Flint, a born financier and organizer, and he had read of the Wrights' experiments with the deepest interest. He invited the brothers to come to New York to see him. The two country boys arrived in the metropolis soon after dawn, about 7 A. M. — for this hour seemed to them as late as they ought

to call — and presented themselves at the handsome Flint residence. Mr. Flint wasn't up and dressed, but he threw on his dressing-gown — for he didn't want to keep the two inventors waiting — and came down to see them.

Mr. Flint had a long conversation with the young men, and was thoroughly convinced of their honesty and knowledge of aëronautics, and of the success of their biplane. As they left the breakfast-room Mr. Flint said:

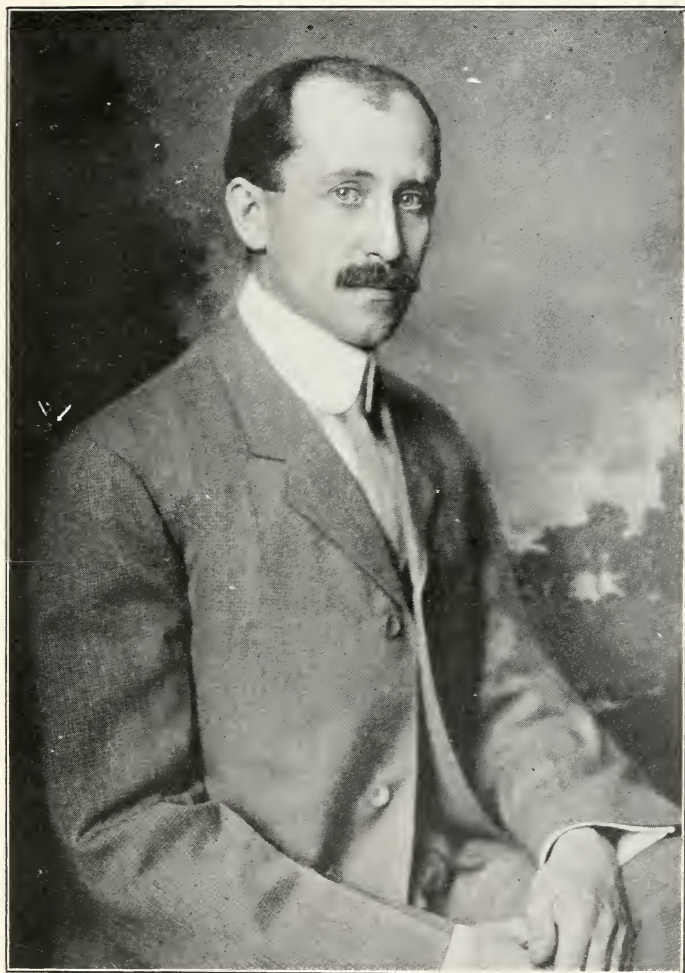
“You may draw upon our firm for \$10,000.”

This gave Orville and Wilbur Wright the sinews of war, and they were now able to take out patents, and start manufacturing their airships. They were also able now to exhibit their machine and demonstrate its capabilities at home and abroad, for one of the brothers went to France to fly.

While Wilbur, in France, was making even Kings gasp, Orville at home was astonishing the natives.

On September 9, 1908, at Fort Myer, Virginia, Orville ascended in his machine, and broke all records by remaining up in the air fifty-seven minutes. The same day, in the afternoon, he made a flight lasting more than an hour, and, on his return to earth, he went up again, this time taking a passenger! On this occasion he broke the world's record for a two-man aërial flight.

About this time the United States War Department began to get interested, for they foresaw the wonderful possibilities of the airship in warfare. So they invited bids for an aëroplane to carry two persons and



ORVILLE WRIGHT

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1900

fly for an hour at a speed of forty miles. Orville thought he could meet these requirements and on September 17, at Fort Myer, he took Lieutenant Selfridge up with him. And now occurred the first fatality in the history of American aëronautics, for after a few minutes an accident to the propeller dashed the machine to earth, killing the lieutenant and injuring the inventor somewhat seriously.

While these experiments were being conducted in America by Orville, Wilbur was busy in France, and, a week after the accident to Orville, Wilbur, on September 24, made a wonderful flight at Le Mans, traveling in the air twenty-five miles and remaining up almost fifty-six minutes.

Three months later, on December 18th, Wilbur succeeded in beating all aviation records up to that date by staying up almost two hours, during which time he covered twenty-five miles. The same day he made another sensational ascent — three hundred feet — and the “Yankee bluffer,” as the French called him, before he got through, had won all the prizes on French soil for which he had striven.

Better than all — for of course the brothers were in great need of capital — Wilbur sold the French rights to his machine to a French financier and promoter for \$100,000.

The next year Italy paid \$200,000 for the Italian rights to the Wright aëroplane.

These European flights caused amazement abroad, and excited overpowering curiosity. The late King Edward, traveling under his incognito of the Duke of Lan-

caster, came a long way to see Wilbur fly, and, after one of his flights, grasped both his hands, and later permitted himself to be snap-shotted with the "man bird," as the French now began to call the daring aviator. It was on this occasion that the boy's sister, Katherine, made an ascent with Wilbur lasting half an hour. She alighted close to the King, who warmly congratulated her upon her intrepidity and safe return to earth. King Alfonso of Spain and also King Victor Emmanuel of Italy, came to see the Wrights fly.

"Kings are just like other nice well-bred agreeable people," was Katherine Wright's opinion after meeting and chatting with some half-dozen sovereigns.

On their return to America from hobnobbing with royalties and great capitalists, Wilbur and his sister got a rousing reception in their home town, and you may be sure that no one was more pleased to see them back safe than their aged father, who had sold his farm — all the property he had in the world — to enable his two boys to go on experimenting with their "bat." Had they failed, it would have meant utter ruin to good old Bishop Wright.

On June 10, 1909, in the historic East Room at the Capitol, Washington, President Taft presented gold medals, on behalf of the Aëro Club of America, to Orville and Wilbur Wright. Mr. Taft, referring to the brothers' achievements in their own and other countries with a heavier-than-air machine, called it a "great step in human discovery." "Many great discoveries," the President added, "have come by accident. Men working in one direction have happened on a truth that de-

veloped itself into a great discovery, but you have illustrated the other, and, on the whole, much more commendable method.

“ You planned what you wished to find, and then you worked over it until you found it.”

These last words of President Taft's give in a nutshell the secret of the Wrights' success — the persevering development of an idea.

Wilbur Wright created an immense sensation in New York City when he flew from Governor's Island up to and beyond Grant's Tomb and back. This was during the Hudson-Fulton celebration when the river was filled with our own and foreign warships. As he flew up the Hudson, less than two hundred feet above many of these marine monsters, the value of the airship in war became startlingly apparent, for he could have successfully bombed any one of them.

The following month the French Government presented the Wright brothers with the Cross of the Legion of Honor — a much coveted distinction, and later on other medals, decorations and honors came the way of these two marvelously courageous and clever Yankee mechanics.

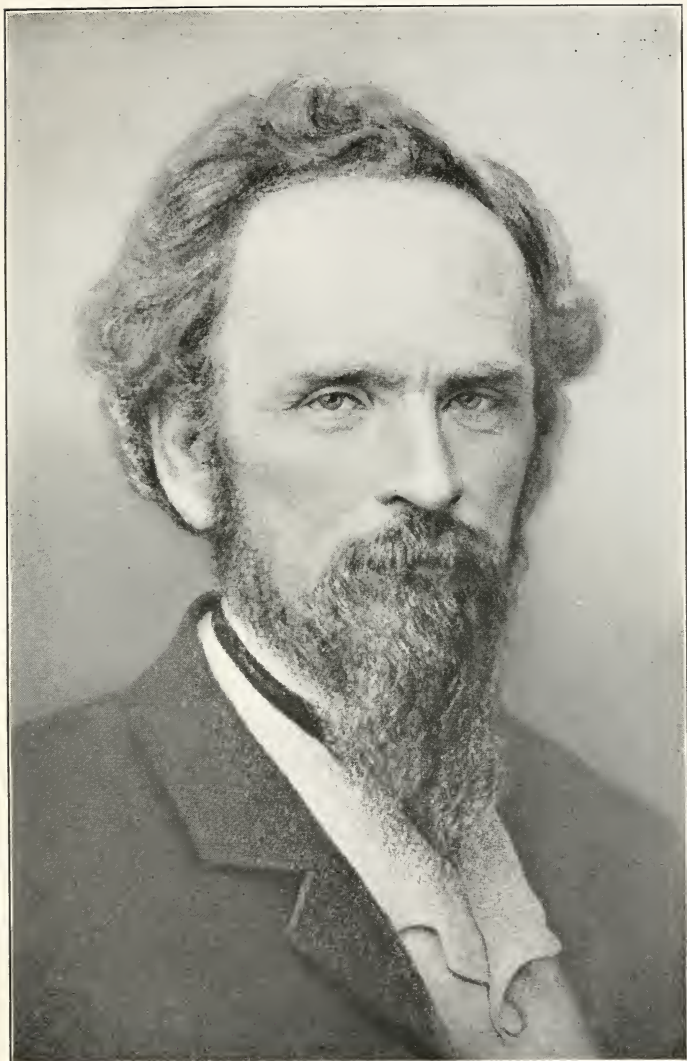
The problem of navigating the air safely and expeditiously being now solved, the Wright brothers were able to organize a big corporation to manufacture Wright aëroplanes, and success and money soon came their way with a rush. For the Wright biplane had given a tremendous impetus to the art of aëronautics, the whole world was making airships of all types, and governments, too, were either buying or manufacturing air-

vessels for war purposes — for transportation of mail.

Thus, through steady perseverance in the face of all sorts of obstacles and difficulties, did these two boys of Dayton, Ohio, win fortune and immortality.

In the annals of American aëronautical adventure and discovery these two inventors, Orville and Wilbur Wright, rule supreme.

LINUS YALE AND HENRY R. TOWNE
WHO REVOLUTIONIZED LOCK-MAKING



LINUS YALE

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LINUS YALE AND HENRY R. TOWNE

WHO REVOLUTIONIZED LOCK-MAKING

THE now world-famous "Yale" lock had its origin in the village of Newport, Herkimer County, New York, about the year 1840, when Linus Yale, senior, began the manufacture, for the first time, of this new kind of lock. They were described as "pin-tumbler" locks, and, besides their novelty, were of great mechanical excellence.

Linn Yale, junior, was born in 1821 and became the foremost lock-expert in the country, far surpassing in skill and inventive genius even his well-known father.

The work of the two Yales, father and son, especially that of the latter, has had a profound and lasting influence on the lock industry. Nearly all American lock-makers, and many foreign countries, have adopted the principles of lock construction introduced by them, and have followed their lead in making improvements in design and in methods of production. Linus Yale, senior, resurrected the ancient *pin-tumbler* of the Egyptians, and adapted it to modern conditions of use, while Linus Yale, junior, by combining it with the small revolving "plug," made possible the use of a flat key, and by embodying the tumblers and plug in a separate unit, or "cylinder," reduced the key to a constant length for locks of all kinds, irrespective of the thickness

of the door on which used. It is difficult to realize to-day that prior to 1865 practically all keys were round, and had to be long enough to reach through the door into the lock, and that a bunch of keys might weigh pounds where it now weighs only ounces. The work of Linus Yale, junior, included also improvements in the combination, or dial, lock for banks which were fundamentally sound and are now embodied in standard practice, and the metallic front postoffice box, now the accepted standard throughout the world.

Linus, from an early age, gave evidence of mechanical ability. When he was not at the village school or at home poring over his books, he was usually to be found at his father's small plant, playing with locks and keys, the workmen's tools, and rummaging in the junk pile.

But the boy, as well as having inventive talent, had artistic tastes and loved to sketch and paint, indoors and out. When he went fishing he would often neglect the fish nibbling at his bait, to make a sketch of a pretty bit of landscape or of a bird or animal.

After he was all through with his schooling, and his father asked him what he was going to be — a painter or a locksmith — he said he thought he'd like to be a painter.

So Linus, junior, began his career as an artist, and for some time diligently worked at his profession, painting portraits and landscapes that bore the impress of true artistic talent.

Before long, however, the young man's inventive genius began to assert itself, causing him to turn his

attention more and more to mechanical pursuits. The example of his father, a successful inventor and maker of bank locks, decided him to abandon his art as a means of making a living and devote himself exclusively to lock-making.

He was a young man of high intelligence, and it did not take him long to obtain a mastery of the business. Within a few years after his father's death, Linus Yale had become the leading bank-lock expert in the United States.

In those days bank-locks were large, very intricate and operated by keys. Mr. Yale, soon after succeeding his father, produced a series of locks of this type that were remarkable for their ingenuity, beautiful workmanship and security. Known as "Yale Locks," they were distinguished by such names as "Infallible," "Magic," "Monitor," etc.

The famous "lock controversy" which arose in England during the World's Fair of 1851 when the American, Hobbs, succeeded in picking the best English bank locks led to similar contests between American bank-lock makers.

The young locksmith was drawn into the controversy and after first discovering how to pick a famous English bank-lock, discovered also how to pick his own best bank-locks, and ended by demonstrating that *any lock having a keyhole* could successfully be picked by one having the necessary skill and tools.

This was a somewhat disconcerting discovery for Linus Yale, the bank-lock expert, to make, but it led to revolutionary changes and improvements in locks,

for from now on he concentrated his attention on the combination, or dial lock, which in crude forms had been known for centuries. To such wonderful perfection did he bring the "combination" lock, that the several types of high-grade bank locks developed by Mr. Yale gave his company world-leadership in the manufacture of bank locks — locks used for bank safes, doors and vaults.

The "Yale" lock, now so familiar on the front doors of residences and on office desks, was brought to perfection by Mr. Yale during the period 1860-64, when he brought out an adaptation of the old Egyptian "tumbler" lock. Its greater security and conveniently small key gave it great popularity.

The evolution in bank and other locks thus initiated by Linus Yale has been continued and progressively developed to this day, completely revolutionizing the world's lock industry.

Mr. Yale was of medium height and build, quiet and somewhat reserved in manner with strangers. Those privileged to know him intimately testify to a delightful personality, responsive nature and keen appreciation of the finer aspects of life. His artistic temperament was ever in evidence and his note-books were filled with sketches, alternately of mechanical ideas, of bits of landscapes, and of familiar faces. He loved to fish and knew all the trout streams near his home. Like many inventors or mechanical geniuses, he disliked business and, when he formed his partnership with Mr. Towne, made it plain that he wished to leave the responsibility of business management largely to him.

This partnership was formed in 1868. In the summer of this year a mutual friend introduced Mr. Towne to the talented and ingenious inventor of locks, Linus Yale, whose business, chiefly in bank locks, then employed only thirty-five men. In October, at Stamford, Conn., was effected the organization, with Mr. Yale as president, now known as The Yale & Towne Manufacturing Co.

Three months later, in December, 1868, Mr. Yale died suddenly and very prematurely, since when the enterprise has been controlled and directed by Mr. Towne. The new firm inherited Linus Yale's brilliant ideas, ideas which have since revolutionized American practice in lock designing, but which were made commercially practicable only by Mr. Towne's remarkable business sagacity. Starting with Mr. Yale's radical departure from the old methods of lock construction, Mr. Towne has greatly amplified these original features and introduced still further radical changes and designs.

Boys developed rapidly during the great national upheaval of the Civil War, and those equal to great responsibilities found the opportunity to show what kind of stuff they were made of. The rise of Henry R. Towne, Linus Yale's partner, to high and responsible positions was one of unexampled rapidity.

Henry R. Towne was born in 1844 in Philadelphia, where his father was one of the owners and operators of the Port Richmond Iron Works. Henry was an unusually bright and intelligent boy, and, after his academic studies were completed, he was sent to the

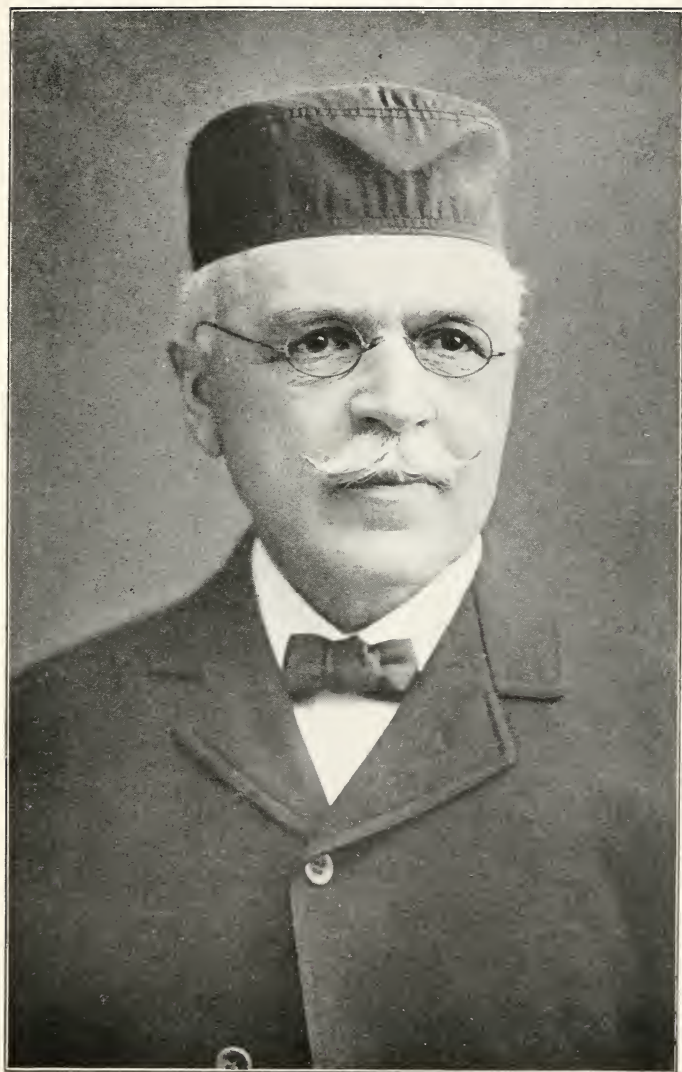
University of Pennsylvania. The War of Secession, however, interrupted his studies, and, at seventeen, he entered the drafting-room of his father's iron works. Such rapid progress did he make that in 1863 he was placed in charge of government work in the shops in connection with repairs on the U. S. gunboat *Massachusetts*.

The Port Richmond Iron Works had meanwhile contracted to furnish the engines for the famous old monitor *Monadnock*, and in 1864, Henry (not yet twenty) was sent to the Charlestown Navy Yard to assemble and erect them in the ship.

Then he was sent to the Portsmouth Navy Yard in sole charge of erecting and testing the machinery of the monitor *Agamenticus* (now *Terror*), and later to the Philadelphia Navy Yard to engine the cruiser *Pushmataha*.

These were tremendously responsible tasks for a youth, but he did them so extremely well, that, though only twenty-one, he was made acting superintendent in general charge of the shops of the Port Richmond Iron Works, the concern in which his father was a partner.

When peace came young Towne realized the need of further and more exact knowledge in many lines of study which the war had interrupted. So he became a close and industrious student under the guidance and instruction of the late Robert Briggs, C. E., and went with him on an engineering tour of Great Britain, Belgium and France. Before returning he took a special course in physics at the Sorbonne, Paris. In the mean-



HENRY R. TOWNE

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time, his father had retired from the manufacturing business.

After returning to the United States, Mr. Towne spent a year in further study and experimental work with Mr. Briggs. During this association he carried on numerous experiments with leather belting, the results of which were accepted as standard for twenty years.

Then, for further education in the designing and use of special machinery, Mr. Towne entered the shop of William Sellers & Co., manufacturers of the Gifford injectors. A year or so later, in 1868, came his meeting with Linus Yale, as related.

Mr. Towne has been the chief factor in the growth and development of the business, and its tremendous expansion in this country and abroad has been due to his unusual combination of mechanical with business ability, his keen foresight and untiring efforts to maintain a product and service of high excellence. He brought to the business the training and practice of a mechanical engineer, together with a natural aptitude for organization and executive management, thus ensuring success.

Mr. Towne was one of the pioneers in the improvement of sanitary and other conditions in factories, and to-day the Yale & Towne plant at Stamford, Conn., with its gardens, library, hospital, school, employment bureau, safety devices, etc., is conceded to be one of America's "model" industrial plants.

During the war the Company, in addition to large quantities of its normal products, such as padlocks,

chainblocks, etc., also made, for the United States Government, rifle grenades, bomb-dropping devices, fuse-setters, pumps, cavalry bits, buckles, fasteners, etc., and special parts for mines, gas nozzles, etc.

Some interesting statistics, for the year 1916, will give some idea of the bigness of this typical American manufacturing plant. The fifty-eight buildings at that time contained four thousand eight hundred machines and eight thousand three hundred belts; the plant's consumption in peace time of coal, twenty thousands tons; fuel oil, six hundred thousand gallons; pig iron, two thousand five hundred tons; steel, four thousand three hundred tons; copper, one million six hundred thousand pounds; lumber, one million eight hundred thousand bd. ft., and water one hundred and fifty million gallons.

There are forty-five thousand varieties of products manufactured, and it costs almost \$100,000 to print and distribute some fifteen thousand copies of the one thousand-page catalog describing them.

The Works' hospital treated, during 1916, twenty-nine thousand six hundred and fourteen cases, of which eighteen thousand seven hundred and twenty-seven were surgical.

The plant now covers twenty-five acres and has upwards of five thousand employees. Half a century ago, in 1868, when Linus Yale and Henry R. Towne founded the business, the plant covered a portion of five acres and had thirty-five employees.

The idea of stamping the word YALE in a coined panel on the keys and all other products of this company was

conceived of by Mr. Towne in 1903, and there are few better-known trademarks.

The company operates another large plant in Canada and has numerous branches abroad.

The guiding principle of the builders of this great business has been honesty of purpose and of endeavor; for, in Mr. Towne's opinion, "There is no legacy so rich as honesty."

ADOLPH ZUKOR
MOTION PICTURE MAGNATE



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ADOLPH ZUKOR

MOTION PICTURE MAGNATE

THE boy who was destined to control the world's moving-picture industry left his home in Hungary for the land of limitless opportunities in 1890. The boy, though only sixteen, was alone, no relative or friend accompanied him, and when he landed at Castle Garden, New York, with only twenty-five dollars in his pocket, no kith or kin met the young immigrant as he landed upon the shores of the New World.

The boy had only a smattering of the English language, and this made it all the more difficult for him to get a job. But he had lots of grit, and the repeated turn-downs did not discourage him in the least. One day, when his money was about gone, he struck oil — got a job at \$2.00 a week as sweeper in a fur store. The proprietor liked his looks — his firm, resolute mouth, his “I can!” jaw and keen visionary eyes.

This was not a very dignified position for the lad Zukor — the future industrial captain — but he put “pep” — individuality — into his task, worked hard, studied diligently at night, and as a result advanced rapidly. He then invented a patent snap for furs, and this again greatly improved his position and especially his pocket-book.

In 1894, when only twenty years old, Adolph Zukor went to Chicago and embarked in the fur trade for himself. It was here that he met his future wife to whom he was married in 1897. He was so successful as a furrier, that his friends began to speak of him as having made his fortune — little dreaming that the youngster was merely on the threshold of a career soon to put him in control of many millions of dollars and thousands of employees, to some of whom he was to pay fabulous salaries.

In 1903 the young fur dealer returned to New York, where before long he began to get dissatisfied with the fur business. It was too slow for a man of his restless ambition. He wanted to make more money and make it faster. So he began to look around for some opportunity in which he could invest his small capital, and make some "big money" on it.

And now came Adolph Zukor's Great Opportunity. One of his cousins, who had started a penny arcade, induced him to investigate its possibilities. One of the first things the shrewd young furrier noticed was the penny-in-the-slot machine's ability to amass money rapidly. Patrons crowded around the machines, parting with any coppers they happened to have in their pockets, their curiosity increasing with each investment. All day and all the evening pennies were dropping into the machines in an unending stream. The masses, at a cost so slight as not to be felt, were patronizing this new form of amusement — and Zukor, watching the procession of visitors to the arcade, saw millions in it.

Here was a way of getting a quicker return on an

investment than anything he had ever seen or heard of — something like “coining money” he thought.

Zukor at once bought one of the machines, and it proved so popular that he decided to venture deeper. So he got a man named Marcus Loew, also a furrier, whom he knew pretty well, to go partners with him in a penny-arcade business. Starting with nine in New York City, the young men before long had a chain of arcade shows, extending to other cities. Thus was founded the Marcus Loew enterprises, with Adolph Zukor treasurer, operating theaters all over the East.

But before this expansion in their penny-arcade business came about, Adolph Zukor was to discover the “movies” and their marvelous possibilities.

The life of the photo-play, when Zukor first saw one, was trembling in the balance. A great novelty at first, the public soon began to lose interest, for the pictures were crude, and there were not enough of them produced to give variety. People got tired of seeing the same play over and over again.

Nevertheless, Mr. Zukor's faith in moving pictures was born, a faith which has increased by leaps and bounds, with the growth of the mighty industry he controls. He installed moving pictures in his amusement places, and very quickly realized that the screen was doomed unless the standard was raised — unless better pictures were produced. The public was tired of “Fourth Reader story films”! So he wrote to the companies that were making motion pictures, begging them for a finer type of play, and, not getting them, he delivered his famous ultimatum:

“ If you don't give me better pictures, I'll make them myself! ”

The photo-play producers laughed; the prophet of the new art was called a “ visionary.” But behind that faraway look in young Zukor's eye was a glint that betokened a shrewd and practical mind, aggressive and ready for battle. He at last waked up some of the manufacturers, with the result that he got better plays, and then, slowly, the public came back.

Then he conceived the great idea of getting well-known plays and players for the movies. He was laughed at, at first, for what well-known actor or actress would condescend to appear, voiceless, to a five-and ten-cent audience!

After several unsuccessful attempts, Zukor finally got Daniel Frohman, the famous theatrical manager, interested in his project, and then Frohman had the hard task of overcoming the prejudice of the actors themselves. Finding this well-nigh impossible Zukor and Frohman decided that the only thing to do was to get the greatest actress of all, Sarah Bernhardt, to play in a silent drama. This they succeeded in doing at great expense, and afterwards had no difficulty in inducing other famous theatrical stars to follow her example.

Thus was the Famous Players Film Company formed with Daniel Frohman as managing director. Their first play, Sarah Bernhardt in “ Queen Elizabeth,” was followed by James K. Hackett in “ The Prisoner of Zenda,” and then came Julia Marlowe, Viola Allen, Mrs. Leslie Carter, Ethel Barrymore, and many others in their most popular rôles.



JESSE L. LASKY

Mr. Zukor's success in his theory — once thought fantastic — that “nothing is too good for the public,” led to considerable imitation, and a number of other firms and companies entered the same field. In 1916 these were absorbed by Mr. Zukor and his associates, the new concern being called The Famous Players-Lasky Corporation, Adolph Zukor, president, and Jesse L. Lasky, vice-president in charge of productions.

It was but a few years back, in 1903, that Adolph Zukor and Marcus Loew caused wonderment in New York by leasing the old Grand Street Theater on the East Side and turning it into a motion-picture theater, selling out in a few months at a profit of \$100,000.

To-day the corporation of which Mr. Zukor is the head stages its plays in countless newly-built and specially designed playhouses, from Maine to California, featuring such well-known and successful actors and actresses as Mary Pickford, Hazel Dawn, Pauline Frederick, Billie Burke, Jack Barrymore, and the grand-opera star, Geraldine Farrar. More than five million people a day see the “movies” in more than eight thousand theaters throughout the United States.

And Mr. Zukor, whose word is law in film fairyland, now counts his wealth in millions.

His name stands out in bold relief in the annals of American Jewry as one of the finest examples of what an immigrant may accomplish in the United States despite poverty, lack of friends and prospects.

For in less than twenty years after landing in America, Adolph Zukor was rich and famous.

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