

## DAVID BRUCE, JR., INVENTOR OF THE FIRST SUCCESSFUL TYPECASTING MACHINE

BY HENRY LEWIS BULLEN



THE earliest known picture of typecasting was published in 1568 by Sigismund Feyrabendt in Frankfort-on-Main in the book "Omnium il liberalium mechanicarum aut sedentarium artium genera continens" (All the liberal, mechanical and sedentary arts). The next earliest picture of typecasting, so far as known, was published in London in 1683 in Joseph Moxon's "Doctrine of Handy-Works Applied to the Art of Printing," in which the whole art of typemaking is thoroughly described and illustrated. Moxon was a typefounder. Prior to his time information relating to typemaking is meager indeed. In 1529 Geofroy Tory of Paris told the world in his "Champ Fleury" that he cut letter punches in steel, just as they are cut today. We have learned, also, by a series of accidents in printing books in various cities and countries that, certainly, from 1468 until 1568, and, probably, earlier than 1468, the types then in use were approximately of the same height and construction as the types now in use. These accidents occurred through the inking balls pulling types from forms, without being observed by the pressmen, so that they were printed across the pages, showing the contours of the bodies of the types on the paper. Five such instances are known. We know also that from Moxon's time (1683) until 1834 types continued to be cast by methods and in appliances which had not changed radically from those used by the first group of fifteenth century printers. During three centuries, then, types had been cast laboriously by pouring molten metals with spoons into hand molds.

In 1834 a new era in typemaking was begun by David Bruce, Jr., who invented a force pump for filling the hand molds with molten metal, thus making the operation of casting much easier, besides doubling the output, improving the printing surfaces of the types, reducing spoilage, and making it possible to cast larger and more ornate types in the molds. This pump is still in use in the matrix fitting departments of typefoundries.

When the force pump was first applied to typecasting, David Bruce, Jr., was a junior partner in the most profitable typefoundry in America, that of George Bruce & Co. The other partner was Peter Crolius Cortelyou, grandfather of Hon. George Bruce Cortelyou, Secretary of the Treasury under President Roosevelt. Efforts toward casting types by machinery had been made since 1804 by several persons. David Bruce had experimented in that direction as early as 1822, but without success. The success of his force pump prompted David Bruce to renew his attempts to manufacture a typecasting machine. In this aspiration he received no encouragement from his partners, who objected to being put to the expense of any experiments. But so intent and enthusiastic was David in pursuit of his new ideas that he resigned his partnership and its profits, and retired to the estate of his father, White Hill, on the Delaware River, between Bordentown and Burlington in New Jersey, where he developed his first machine, patented March 17, 1838. This machine, the principle of which is still in extensive use, with subsequent improvements, most of them made by Bruce himself, is a combination with an automatic force pump of mechanisms for holding and controlling a hinged adjustable mold, opening and closing and approaching the nipple or spout of the pump, returning from the nipple and opening and discharging the cast type, each operation being entirely automatic. The machine was operated by a hand wheel. It made typecasting, than which few operations had been more laborious, an easy operation, and discharged the types at an average of about forty a minute, on bodies of fourteen point and under. The chief

detail of the invention is the movable discharging pin, which projected itself slightly into the casting chamber of the mold at the moment when the molten metal entered, thus embedding itself slightly in one side of the body of the type, for the purpose of preventing the type from leaving its position in the mold until the mold reached its discharging point, upon which the pin was automatically drawn back and the type fell into



Earliest picture of typecasting from a wood cut by Jost Amman, published in 1568, in Frankfort-on-Main, by Sigismund Feyrabendt. The caster is pouring the metal into a mold. Extra molds on top shelf, at rear. Behind the caster a rubbing stone, on table, by which the bodies of the types were finished.

the receiving box. This highly ingenious and original device created the circular indentation found in types cast on the Bruce machine, known as the pin mark, in which typefounders cast their identifying devices. These devices were engraved on the face of the discharging pin.

Through the failure of a careless patent attorney to specifically patent the discharging pin, the way was left open for its application to other methods of controlling the molds, which brought upon David Bruce a series of litigations in defense of his patent.

While the machine was being developed at White Hill in New Jersey it was exhibited to Elihu White, a typefounder whose business will be remembered by many of our readers under its later name of Farmer, Little & Co. He was about to buy the exclusive right for its use in New York city when he died, in 1836. When the first machine was completed, James Conner, another New York typefounder, persuaded David Bruce to give it a two weeks' trial, as a preliminary to purchase, in the Conner Type Foundry. As Mr. Bruce tells it:

I accepted the invitation, but after the trial of two weeks gladly declared my machine a failure. During this trial James Conner was absent, and although the trial was ostensibly in a private room, it was made under the observation of a hostile group of workmen. The opposition, cunning and devilry of the short sighted workmen, from the caster down to the breaker boy, soon determined me to withdraw it from trial. The workmen, not content with having my declaration of failure, sought to signalize the event by something more effective. I had purchased from Mr. Conner a small yacht, and proposed to return home on the Delaware river with my machine. A leading malcontent workman, who was known to be a good waterman, under assumed friendship volunteered to navigate my bark down the bay. My craft was to be "accidentally" upset, and your humble servant was to scramble for his life, the best way he could, while my machine was to find the bottom of the bay. This, it was thought, would be a perfect damper on all my future attempts at improving typecasting machinery. But the scheme did not work. I was advised by some of my friends of the plot. Myself and traps arrived safely home by another route, and here am I, some fifty years older and perhaps a little wiser! Somewhat discouraged, I confess, in a fair trial or possible introduction of my invention, it lay for many months in my shop in New Jersey. In the meantime I worked on a machine to rub the types after casting, and, completing the latter machine, I began casting types in my own premises, availing myself

of help procurable in a rural district. After casting 600 pounds of minion, and rubbing it with my patent rubbing machine I was sufficiently satisfied.

A few months later I was in New York manufacturing types by my own inventions. But another obstacle arose to confront me: the established odium against machine cast types. It is true that then, with the exception of my old schoolmates, the Harper Brothers, and a few old friends, I stood alone. Timid printers listened, shook their heads, and no doubt inwardly pitied me! To me the future bore a gloomy aspect. I had not called upon my uncle [George Bruce] during these years, deeming him entirely too conservative to approach, so imagine my surprise when he suddenly appeared before me with a view to inspecting the performance and product of my machines. His investigations were critical. He was looking for practicability. The performance evidently pleased him, and as I was in no condition to refuse a liberal offer, he became the purchaser.

He evidently was pleased with the purchase, but pleasantly remarked that should I ever make an improved machine, or any improvement in the line of typecasting, I must surely give him the offer of first purchase. My No. 1 patent was soon set to work, and from the circumstance of his boldly facing the prejudice against machine cast types, and making no abatement in the selling price to consumers, a new era was created in typefounding.

David Bruce set to work to make a better machine to which power might be applied, and which would cast types faster. He succeeded in doing this. Type machines now in use are substantially the same as this Bruce No. 2 casting machine, patented on November 6, 1843. When the machine was ready and tested, his wealthy uncle, George Bruce, was invited to inspect it and exercise his option. George sent his partner, Cortelyou, and a machinist, Lauritz Brandt, to inspect the machine. They reported adversely, and thus, as George Bruce obstinately refused to examine it himself, the transaction closed. Cortelyou had previously reported adversely on the No. 1 patent, but on that occasion his report was not allowed to prevent the purchase. Of Cortelyou, David wrote:

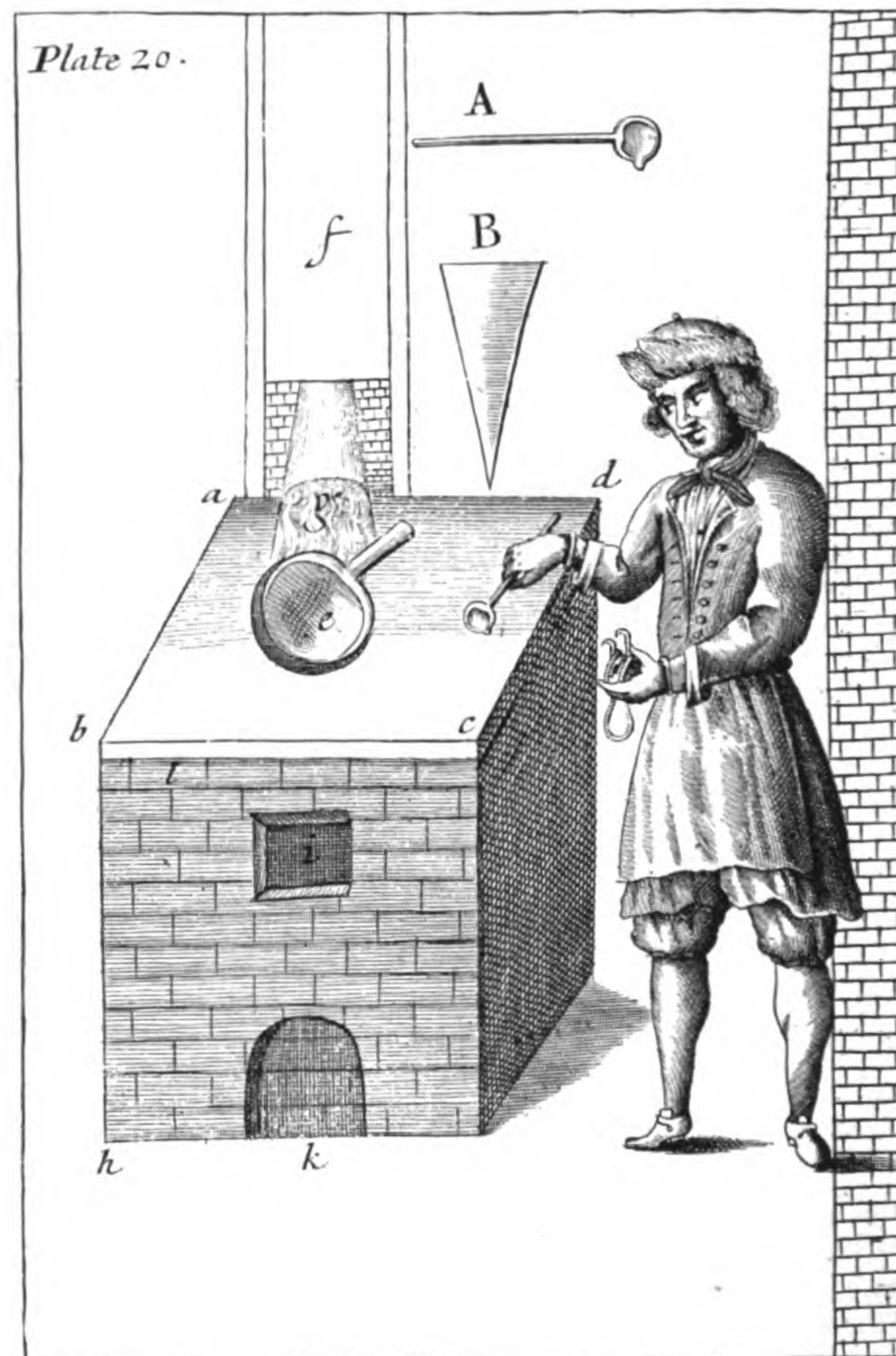
Mr. Cortelyou was a remarkable character; honest to the core; but an uncompromising fossil on improvements. Two years before Mr. Bruce purchased my No. 1 patent Mr. Cortelyou was sent into New Jersey to inspect it. He reported adversely; hence at that time there was no purchase, nor was it purchased until Mr. Bruce saw it himself. To do myself justice, I may say it was through my influence that we (Cortelyou and myself) were taken in as partners with Mr. Bruce at the same time, and it was through his opposition to the introduction of any new facilities that I was ousted therefrom. So obtuse was Mr. Cortelyou that even after I had invented and made the now universally used fitting up force pump, to overcome the absolute inability of casting ornamental letters by hand, he could not perceive its advantages over the slow and slovenly process of pouring the metal.

The other adverse inspector, Brandt, made a working model of the Bruce machine, took it to Europe, represented himself as the inventor, and made a moderate fortune. However, a purchaser for the No. 2 patent soon appeared in Michael Dalton, of the Boston Type and Stereotype Foundry, and a trial in Boston was arranged. It was successful and thus an agreement, which lies before us as we write, was signed, sealed and delivered on March 4, 1844, under which the purchasers for the sum of \$1,800, acquired the privilege of making machines for their own use in the States of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island and Connecticut.

David Bruce, Jr., made and patented various minor improvements in typefounding down to 1868. In his later years he resided in the Williamsburg district of Greater New York. He had two sons, who were the principal letter punch cutters for their uncle, David Wolfe Bruce, owner of George Bruce & Son Company.

The Bruce typecasting machine was not the first. The idea of casting types by machinery originated in America as early as 1804. From 1806 to 1823 and later various patents were issued in England and in France for improvements in casting from type molds, but all proved to be impracticable. In 1804 William Wing, of Hartford, Connecticut, who had never seen a type mold nor entered a typefoundry, invented a machine for casting types in gangs of alphabets held together like the teeth of a comb, to be sawed asunder after casting. He interested Elihu White, also of Hartford, who also knew nothing about typefounding, but was willing to finance Wing. At the end of three years no satisfactory types had been cast. Meanwhile White had visited Scotland and brought back with him punches, matrices and molds. White and Wing came to New York in 1808, and established a typefoundry on regular lines, which flourished. In later years it was conducted by White's

successors, Farmer, Little & Co. It ceased to operate in 1909, thus completing one century. White, however, despite the failure of the Wing patent, did not give up the idea of making types by machinery. He financed W. M. Johnson, of Hempstead, Long Island, who, in 1826, patented a workable type-casting machine twelve years before that of Bruce. The Johnson machines, improved by Mann and Sturdivant, were

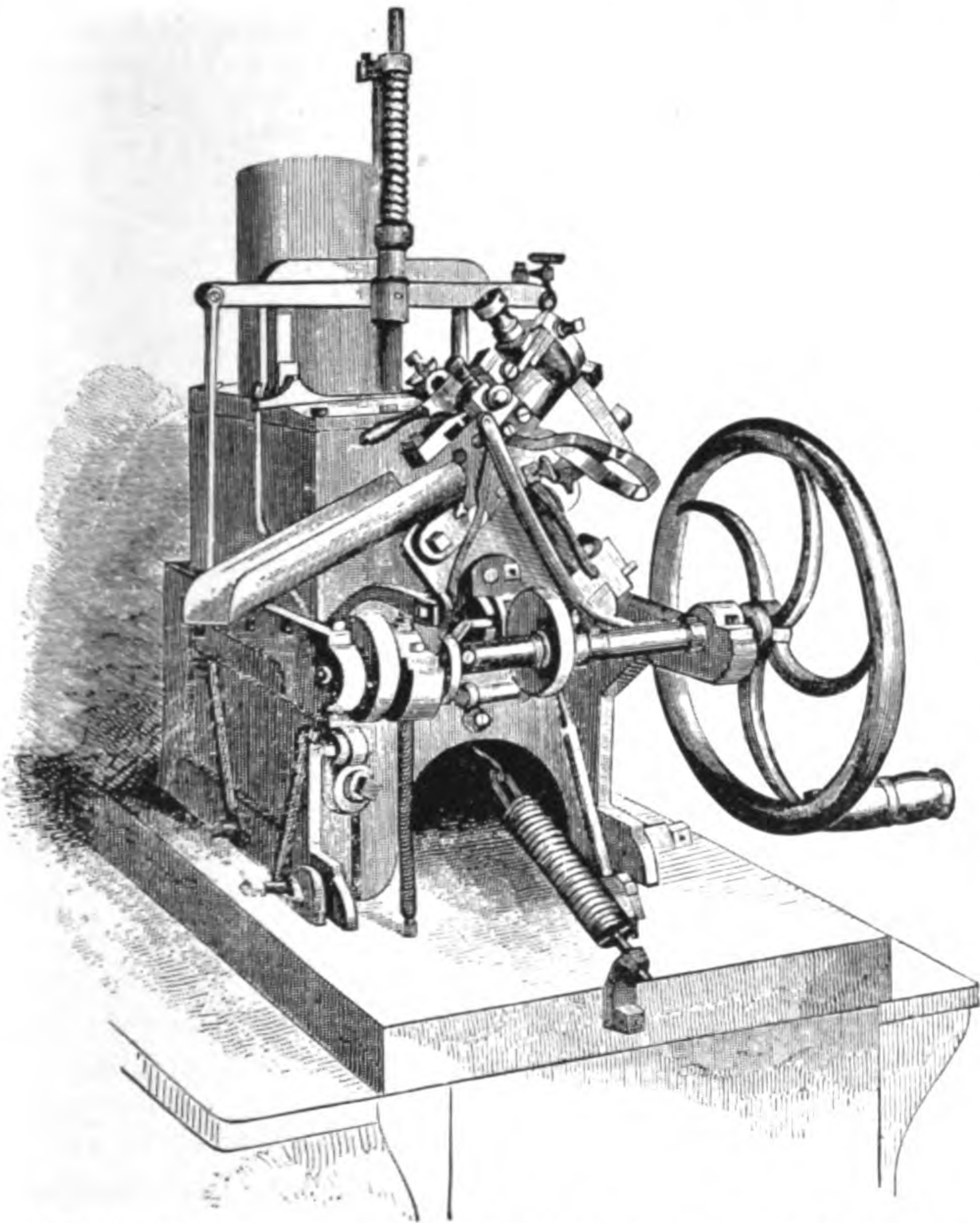


Typecasting in 1683. The style of the mold has changed, to make casting easier and quicker, but the general method is the same as that used in 1568 and which continued to be used with minor improvements until 1838. Illustration from Joseph Moxon's "The Doctrine of Handy-Works Applied to the Art of Printing." A, ladle; B, piece of leather to be attached to mold to protect caster's hand from being scorched; e, metal pot; f, flue of furnace; g, flames emerging through opening over which the metal pot was placed.

used in White's typefoundry, but the types cast in them were not popular. They were porous, weighing from fifteen to twenty-five per cent less than hand cast types. It is said that when a form set in these types was lifted, the bed of the press would be covered with particles of metal fallen from the feet of the types. White advertised that, as his types were lighter, printers received more types to the pound, while his prices per pound were no higher. Opposition typefounders guaranteed buyers that their types were *not* machine made. White had gathered around him a number of able mechanics, some of whom attempted to remedy the defects of the improved Johnson machine, but all without success. Through White's persistence in casting defective types by machine the printers conceived a deep prejudice against machine cast types, until finally the Johnson machine was discarded, after costing great sums of money. Notwithstanding this expensive failure, such was White's faith in the possibility of casting by machinery, that he was, in 1836, the only typefounder eager to buy the New York rights of the No. 1 patent machine of David Bruce. Both the Wing and the Johnson machines were tried in England and failed. Bruce had discovered the only practicable method of casting types with an automatically controlled jaw

action mold. His invention, however, only covered the casting operation. The processes of breaking, rubbing, setting, finishing and kerning remained to be done by hand. Nevertheless from 1838 to 1885 nothing equal to the Bruce machine was developed. In the latter year the Barth automatic type-casting machine was put in use in Cincinnati, the first machine which satisfactorily completed the making of a type in one operation — but that is another story.

The Bruce family of printers and typefounders had an interesting history. They were descendants of John Bruce, a farmer, of Wick, in the county of Caithness in the far north of Scotland, to whom on November 12, 1770, a son, David, was born. David went to sea, and before nineteen summers had passed over him he had seen a great part of the northern hemisphere. His family had meanwhile moved to Edinburgh, and there in his nineteenth year David apprenticed himself to a printer. Having acquired a thorough knowledge of his craft, as his work proves, he is next found in 1793 arriving in New York, a city of 40,000 inhabitants, something less in importance than either Boston or Philadelphia, where he found employment as a pressman on a daily newspaper. Next year, 1794, he was working for Hall & Sellers, successors to B. Franklin and David Hall. David Bruce sent money home to bring his brother John to Philadelphia, but in the meantime John had gone soldiering against Bonaparte in Egypt, so his



The No. 2 Patent Bruce Typecasting Machine, patented by David Bruce, Jr., in 1843, superseding the No. 1 Patent Typecasting Machine patented in 1838. This machine quadrupled the output of the typecaster, made the work easier, and improved the quality of types. More machines built on the principle of the Bruce invention are in use today than any others.

parents sent George Bruce, aged fourteen, in his stead. George reached Philadelphia on June 26, 1795. The two Bruces were not without friends. David had known Archibald Binny in Edinburgh, and when Binny and James Ronaldson and David Ramage arrived in Philadelphia on one ship in 1795 they soon found David Bruce and his young brother. Binny & Ronaldson set up the first permanent typefoundry in 1796 (which finally developed into the American Type Founders Company), and in the same year Ramage opened the first shop

for building printing presses. Here were got together five young Scotchmen who afterwards achieved both wealth and fame, although their combined cash capital was less than \$600. George Bruce was put to learn bookbinding, but not liking his employer he ran away to sea. Returning soon to Philadelphia, his elder brother persuaded him to apprentice himself to Thomas Dobson, printer. After two years, in 1798, Dobson's plant was destroyed by fire, and an epidemic of yellow fever prevailing, the brothers left the city and walked across New Jersey to New York city. Not finding employment there, they walked to Albany, where they worked for Webster Brothers. In 1799 they walked back to New York city. In that year the first American printer's union, the Franklin Typographical Association, was formed in New York, of which David Bruce was elected vice president, while George was secretary. The young union formulated a demand for higher wages. Compositors and pressmen were getting \$6 a week of seventy-one hours. They demanded \$7 and got it; nothing was said about the hours, but overtime was price and a half.

In 1803 and for two years thereafter young George Bruce's name appears in the *Daily Advertiser* as "printer and publisher for the proprietor." What David was doing we know not, but both had married, and George was already a widower. In 1806 there was a printing outfit, with one hand press, to hire. The Bruce boys hired it, and began to print Lavoisier's "Chemistry" in a small room in a building on the southwest corner of Pearl and Wall streets. Their friends in Philadelphia, the prospering typefounders and the prospering press builder, gave them credit for types and materials. Their work was better than New York publishers could get elsewhere. They also prospered, and in 1809 removed to No. 27 William street, where they kept nine wooden hand presses busy. When the publishers failed at times to keep them busy they published books on their own risk. It would seem that honest industry, working more than eight hours a day, had little trouble in getting ahead in those times when the city was literally "little old New York." The Bruces were well read, studious men. They would select a standard book to print on their own account. They would then ask publishers and booksellers throughout the land to agree to take and pay for certain quotas, printing the bookseller's name on the title pages of his quota. In this way they would have a sure venture. In this way they issued a series of Latin classics and a New Testament and a complete Bible. There was thus no lost time in the shop — no non-chargeable hours. Compositors and pressmen working for \$7 obtained good board and lodging for \$2.50; working twelve hours a day, with occasional overtime, with few holidays, and everything shut down close on Sundays, there was little opportunity to squander their earnings.

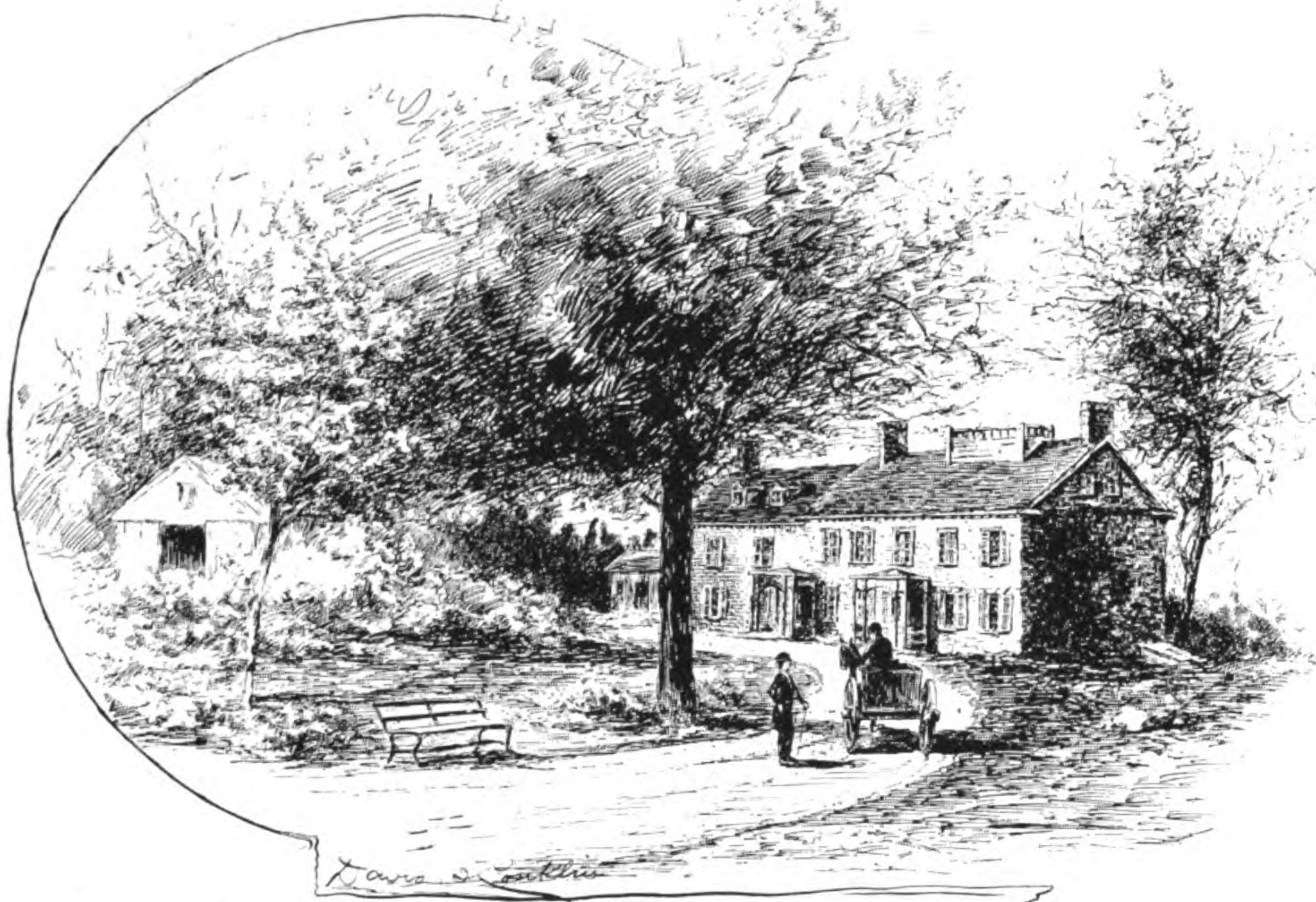
In 1812 David Bruce, Sr., went to England to learn the art of stereotyping, recently revived under the auspices of Earl Stanhope. The earliest and best method of stereotyping was from plaster of paris molds. We do not know what prompted David to learn stereotyping, but probably it was the advent in New York of one John Watts, who brought a knowledge of stereotyping to this country, and issued the first book from stereotyped plates in America in 1813. Watts, disappointed in his venture, went back to England, and shortly after his return went to Holland and Germany, selling the secrets of the process. David Bruce, Sr., found the English stereotypers secretive. He saw their work and got in touch with some of the workmen, and discovered enough of the process to put it in practice in New York. While away he kept his brother partner advised of his progress and of his visit to his relatives. These interesting letters are now in the Typographic Library and Museum in Jersey City. Unable to buy any of the apparatus used by the two English stereotyping firms, David had to design and have made in New York his furnaces, molds and other appliances. While these were in the making

another obstacle presented itself: both the existing typefoundries refused to cast the high spaces and quads necessary to the clay process. Fortunately for the Bruces, in that year, 1813, two brothers, Edwin and Richard Starr, skilled type-makers employed by Elihu White, had a desire to become master typefounders. They had accumulated a typemaking outfit, and had finished a set of nine point (bourgeois) matrices. Lacking capital, they were willing to take the Bruces

his surviving son, David Wolfe Bruce, who carried it on until his death in 1895, leaving it to three heads of departments, who eventually sold it to a competitor.

David Bruce, Sr., soon repented his leisure. In 1824 he returned to New York and established a typefoundry with his son, David, Jr., and George B. Lothian. This project was rather to develop improved appliances for casting types than to cast types for sales. Both father and son were inveterate inventors. At the end of two years the experiments were decided to be unprofitable, and David, Sr., returned to his farm. He died in Brooklyn, at the home of his son, on March 15, 1857, aged eighty-seven years.

David Bruce, Jr., was born February 6, 1802, at No. 40 Dey street, New York. Leaving school at the age of sixteen, he was sent to Philadelphia to the printing office of William Fry, to acquire a general knowledge of printing. After a short stay in Philadelphia he entered the typefoundry of D. & G. Bruce in New York, remaining there until 1824, when he became partner with his father in a venture in typefoundry which was unprofitable and ended in 1826. He then went to Albany as superintendent of the Kinsley Type Foundry, and incidentally devoted himself to letter punch cutting. In 1831 he was again in New York, attempting a typefoundry business with Edward Pelouze and



The place where David Bruce, Jr., invented and made the first successful typesetting machines, working in the attic of his father's residence, the homestead at White Hill on the estate of David Bruce, Sr., on the Delaware river, between Bordentown and Burlington, New Jersey. David Bruce, Sr., acquired this ample estate in 1820, when he retired from the typefoundry firm of D. & G. Bruce, New York city. This sketch was made by David Bruce Conklin, grandson of the inventor.

in as partners. A font of nine point types and other accessories were cast, and in 1814 David Bruce made two sets of plates for a complete Bible. One set was sold to Mathew Carey of Philadelphia, the other was used to print several editions of the Bible, which the Bruces disposed of profitably. Before a year had passed a disagreement arose. The Starrs were bought out by the Bruces to save their investment. They tried to sell their outfit to the two existing typefoundries, but it was so incomplete that they could get no offers. Thus they had the nucleus of a typefoundry with no knowledge of the art, and no skilled employees. How they surmounted this unfavorable condition we do not know. Doubtless they found a skilled workman, or more than one, and George Bruce began to perfect himself in letter punch cutting. In 1815 they issued a few leaves of specimens of body types, adding to them gradually. They sold their profitable printing business to two employees. In 1816 their type and stereotype foundry was in Eldridge street. George managed the typefoundry and David the stereotype foundry. In 1814 David invented the first plate shaving machine. The English stereotypers were leveling their stereotype plates by holding them against a revolving disk equipped with knives. By their method they could not regulate the height of the plates. Bruce's flat bed planer went into use everywhere and is today more than ever an indispensable machine in electrotyping establishments.

In 1818 the Bruces erected a building on Chambers street, which was the home of the typefoundry until 1895. In 1820 David retired, purchasing the White Hill estate. He was then fifty years of age. George in the same year sold the electrotyping equipment and concentrated on typefoundry. In six years he had become the leader in that art and industry. He died on July 5, 1866, aged eighty-five, leaving his business to

John Bell. In a little less than a year this partnership was dissolved and David entered his uncle's establishment as a junior partner and head of the punch and matrix department. Two years later, in 1834, he withdrew, as has already been told, to devote himself to the invention of his typesetting machine. After the successful marketing of his No. 2 patent typesetting machine David Bruce, Jr., took up his residence in Williamsburg, on Long Island, across the river from New York city. There he had a workshop on South Eighth street, near Third, where he made casting machines and cut punches. In 1846 he completed a small typefoundry, entirely the work of his own hands, with an equipment of eight machines. This he sold to Peter C. Cortelyou. Two sons, Wallace and Robert, also carried on a punch cutting business in Williamsburg. Wallace is the sole surviving member of the Bruce family.

David Bruce, Jr., spent his later years in well merited ease and comfort, dying at the age of ninety on September 20, 1892, at his residence, No. 782 South Fourth street, Williamsburg. In his active years he was the leading punch cutter in America, producing a long line of type faces, borders and ornaments. He cut the light face roman series which first contributed to the success of the Conner Type Foundry. Other type faces cut by him are Secretary, Madisonian and Hancock scripts, Rimmed Shade and Rimmed Roman, and others popular in their day. He was a contributor on historical subjects to the printing trade journals of the sixties and seventies and on philosophical subjects to various magazines. For his inventions he was awarded the gold medal of the Franklin Institute. His inventions benefited printers as well as typefounders in every country in which types were made. For more than half a century he was the most distinguished personage in the typefoundry art and industry.

mocketh at ugliness in any form whatsoever. So mote it be with all printermen.

\* \* \* \*

### Charles Francis

CHARLES FRANCIS and his daughter were in Brussels on February 11. Shortly before that date they visited the Plantin-Moretus Museum in Antwerp, the greatest shrine of early printing, and also the battlefields in France.

In Verdun they saw a graveyard in which lie the remains of 400,000 Frenchmen; a mile or two away another in which lie the bodies of as many Germans; in another the bodies of about 40,000 Americans; all done to death through the selfish folly of half a dozen men, unrestrained by one man who, alone in the crisis, had the power to say No!

Charles Francis and his daughter are now on the way to Argentina, whence they go to Brazil and then home. Since leaving home they have visited Japan, the Philippines, China, Australia, New Zealand, Tasmania, South Africa, Italy, France, Belgium, Holland and Great Britain.

It is now sixty years since our good friend began to print. In this glorious and well earned holiday he has enjoyed good health, and has been received with great hospitality by printers in every country he has visited. Meanwhile his well organized and loyally managed business sails along successfully.

\* \* \* \*

### A Reminiscence

IN 1887, while David Bruce, Jr., the inventor of the first casting machine, was still living, at the age of eighty-five, *Collectanea* wrote and published in *The Printers' Review*, of Boston, the first biography of the inventor, and in the same year contributed an article on the same subject to THE INLAND PRINTER. Strange to say, that early effort remains until today the only literary memorial of the important achievement of a man of the highest character and ingenuity. The facts were taken from Bruce's own lips, and are repeated in the biography printed elsewhere in this issue.

Until his death, five years later, at the age of ninety, Bruce's mental faculties were clear and his ideas philosophic, humorous and benignant. After Bruce's death in 1892, his son Wallace, a letter punch cutter still living, presented *Collectanea* with two manuscript histories

of typefounding in America, one written in 1874, the other in 1888, together with a copy of the first Bible printed in America from stereotyped plates and one of the plates. These memorials are now in the Typographic Library and Museum, in Jersey City. The stereotype plate, made by the clay process by David Bruce, Sr., carefully beveled and shaved on the planing machine invented by himself, is superior to any stereotypes now being made in America. Since 1892, *Collectanea* has from various sources received a number of original agreements which were made between the inventor



Coat of arms believed to have been used by Johann Mentil, first printer of Strasbourg, and said to have been granted to him when he was ennobled by Frederick III., emperor of Germany. Whatever its origin, it was adopted by the printer guilds of Germany. Our picture is reproduced from a copperplate engraving used at the end of a book issued in Leipsic in commemoration of the third centennial of the invention of typography.

and typefounders who purchased the right to use his machines.

Bruce sacrificed fortune to accomplish his invention. He resigned his position as partner with his uncle in the profitable typefoundry of which his father was the actual practical creator, getting no compensation, because his uncle would not permit him to experiment in the foundry. His failure to take out foreign patents enabled a rogue to take the invention to Europe and dispose of it there as his own. The conservatism of the typefounders of his time made the returns from his invention slow and inadequate. Worst of all, his failure to specifically claim in his patent the most vital detail of his invention, the discharging pin, made it possible for others to imitate and use his invention. Though by no means a poor man at his death, he was deprived of a larger return which belonged to him of right. Withal he had a kindly thought for all, and, as years rolled by, found excuses for those who had deliberately defrauded him. Even the memory of this truly modest and unaggressive man was in danger of depending upon a few short scattered references. In whatever groove of life his destiny might have been cast he would have been masterfully progressive.

### Numerals

OUR numerals are of Hindu origin. We derive them from the Moors of Spain, who brought them from Arabia. They were known in Europe in the eleventh century, but did not supersede the cumbrous Roman numeration, by means of letters, until after the invention of printing. It was the printers who brought them into use. The earliest numerals, both Hindu and Arabian, were from 1 to 9. The cipher was a later invention, of incalculable importance. The Roman system of numeration is not unlike the Assyrian and Egyptian systems in principle. The Chinese and Japanese numeration follows the Assyrian system more closely.

\* \* \* \*

The love of Art is probably one of the commonest of human instincts. The power to discriminate comes from special training. The buyer of artwork who has not advanced beyond the obvious forces the artist to produce inferior work. Where a practical artist is given a problem and allowed—with the help of his special training—to solve it, the result is more often satisfactory than it could possibly be where he is handicapped by positive instructions.—*F. Kirk Johnston.*

\* \* \* \*

Advertising is increasing tremendously in volume. Therefore to be noticed, advertising must be increasingly better in quality. A man who may be notable in a small city may be obscure in a great city. To be notable among a hundred thousand advertisements requires a better effort than to be notable among five thousand. \* \* \* \*

Books are not made for furniture, but there is nothing that so beautifully furnishes a house. A little library growing each year is an honorable part of a man's history. It is a man's duty to love books. A library is not a luxury, but one of the necessities of life.—*Henry Ward Beecher.*

\* \* \* \*

When a book is at once both good and rare, no casket is rich enough, no casing sufficiently durable to honor and keep safe such a jewel.—*Charles Lamb.*

\* \* \* \*

Nothing will ever be attempted if all possible objections must be first overcome.—*Dr. Johnson.*