Electrical HIGH STEPPER

GUESTS at a formal function in a New York hotel of the Nineties paused momentarily in their merrymaking to gape at a latecomer. The fastidiously correct rubbed unbelieving eyes, women tittered uncontrollably behind fans, and Mrs. William Stanley of Great Barrington, Mass., blushed furiously, vowed never again to leave her husband unattended while he dressed for any public appearance. It was not that William Stanley had neglected to don any part of his attire, but, absent-minded as ever, he had failed to make a complete change to formal garments. He burst into the ballroom in full evening clothes—with red tie, blue shirt, and brown shoes.

Preoccupation, traditionally typical of genius, was no stranger to William Stanley, adventurer in electricity, stepper up and stepper down of alternating current, developer of the transformer. Alert, restless, possessed of a ready humor and a flashing wit, the inventor of the first commercially practical alternating current transformer rarely ceased to think shop. For all his reputation as a raconteur, his facility at repartee, his intense interest in people and in personalities, William Stanley seldom strayed far from the field of electricity where his name ranks with the greats of all time. It is, indeed, due to his devotion to research, to his courageous advance into little known territories, that the world now leads electricity on a leash.

The transformer, which Stanley fathered in 1885, is the heart of the alternating current system of transmitting and distributing electrical energy. Without it, the modern super-power system of transmitting this life blood of the nation to industry, to the home, and to far-flung rural communities would be impossible of attainment. More imposing than ever is the achievement of the dynamic electrical pioneer when it is realized that Stanley produced his masterpiece with little theory or precedent to guide him, with only the humblest of facilities, beset by a want of suitable materials, hindered by inexperience, and with almost a total lack of encouragement from others.

His contemporaries actually decried his efforts to develop an alternating current system. Edison and Britain's Lord Kelvin (Sir William Thomson) violently opposed the use of alternating current as dangerous and impractical. But Stanley persisted, eventually won the recognition and backing of George Westinghouse, and, with Westinghouse, captured the Edison Medal of the American Institute of Electrical Engineers for his contribution to the development of alternating current.

In 1884 Massachusetts-born William Stanley was working in the Westinghouse shop at Pittsburgh on the development of direct current systems and the incandescent bulb which Westinghouse was marketing. By spring of the following year, the youthful engineer had turned his attention to the problem of alternating current to which he had already given some thought.

In England, at the time, the firm of Goulard and Gibbs was experiencing a fair degree of commercial success with what has generally been recognized as the first alternating current transformer. American rights to this machine were the property of Westinghouse, and Stanley based his experimentation on the Goulard and Gibbs device. He altered the system extensively, however, and rejected the G & G plan of operating the primaries in series by a constant current. Instead, he chose a method of parallel connection to a constant potential primary circuit. Tested in the Westinghouse shops in the early fall of 1885 this original Stanley transformer was found to be amazingly efficient.

Failing health made it necessary for Stanley to return to Great Barrington, and throughout the remainder of 1885 and during the early months of 1886 he tinkered, altered, and improved his transformer in a shop set up in an abandoned rubber mill in his home town. Within a few months he had developed an alternating current system which extended the radius for incandescent lighting at first for a few miles, then for much greater distances. Under his system, small wires carried small current to the consumer's premises where it was transformed to a large current for operating lamps. In this switch and the coincidental change from high voltage to low, the transformer was the significant feature.

While this independent enterprise was developing at Great Barrington, Reginald Belfield, Goulard and Gibbs engineer, arrived in Pittsburgh and appraised one of the original Stanley transformers. On completing his investigation, he rated the device of high value, cheaper to build than the G & G converters, smaller in size, and more generally useful for electric lighting.

With this recommendation, and in view of the progress Stanley had

(*Continued on inside back cover*)

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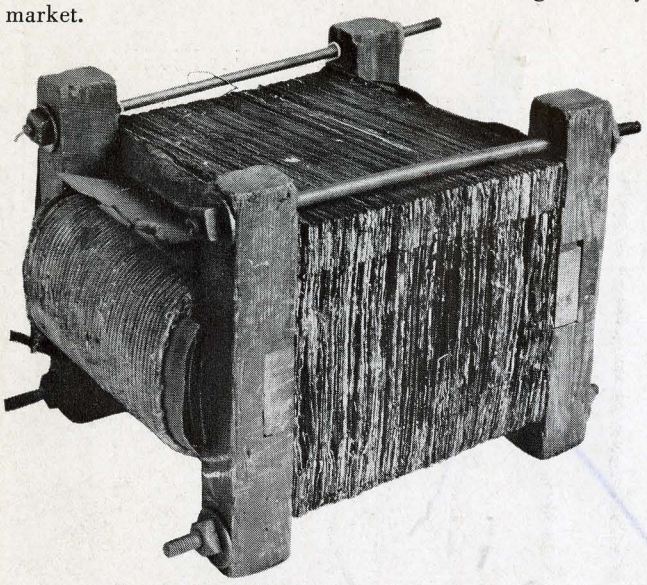
ELECTRICAL HIGH STEPPER

(*Continued from inside front cover*)

made in 1886 with a practical alternating current system, it is scarcely surprising that Westinghouse once more became interested. By mid-1887 the company was turning out Stanley transformers on a commercial basis and finding a ready market.



Stanley's earliest practical transformer.

The Stanley plant at Great Barrington, later taken over by General Electric, demonstrated for the first time in America how electric power could be generated at low voltage, transformed for transmission to a higher voltage, stepped down again to a lower voltage and used at the latter voltage according to requirements. Thus it is due to the courageous pioneer work of courteous, friendly William Stanley, to the brilliance and persistence of this absent-minded genius, who died in 1916, that alternating current systems now can adapt voltage to varying requirements and maintain it substantially constant, irrespective of load. And it is his achievement that opened the way to the enormous progress attained during recent years in the transmission of electric energy.

INDUSTRIAL BEAUTY SHOP (*Continued from Page 18*)

process. The dust collector traps dust at its source. For instance, over wood-working or metal-working machines, or at a tipple where dust is being raised, a hood is placed. The dust is drawn through pipes to the dust collector where the dusty air is filtered through screens which remove all particles. The collector discharges the clean air and keeps the dust for disposal. Within the last six months Pangborn Corporation introduced electrostatic precipitation for industrial air and gas cleaning. This is a development of Westinghouse research. Through electrical discharge all dust, dirt, or gases are precipitated on metal plates and the precipitation collected.

The novel and wide application of shot blasting to memorial carving was developed by Pangborn engineers. Carving on stone or marble is cut with fine steel shot and not with sand or other abrasive. Petals of flowers, the graceful sweep of leaves and stems are easily and quickly formed by blasting through a special gelatinous stencil which is called "jiffy-stencil." In sheet form, this adheres to the granite or marble when moistened, and the patterns are cut by the shot from the blast nozzle. Thousands of monument establishments have been supplied with Pangborn equipment for stone carving.

LUBRICATION. The machine shop, where the bulk of the company's production and assembling is done, has the usual equipment of lathes, drilling machines, vertical and radial drill presses, vertical and horizontal boring mills and press grinders. In the sheet metal department are squaring and rotary shears, gang and single punches, combination punch and shears, leaf bending brakes and press brakes, frame cutting machines, and arc welders. In the wood-working department are rip and cutoff saws, planers, joiners, and molders. Esso Marketers products are used in the lubrication of all machinery.

For general plant lubrication Pangborn uses Faxam 46; for air compressors, Teresso 52; for cutting high carbon steels, Pennex 47; for enclosed gears, Essolube Gear Oil; for grease lubrication, Estan Lubricant; for cleaning surfaces of metal prior to applying final paint job, Varsol; for firing cupolas in the foundry, Essoheat Medium.

Pangborn Dust Collecting unit and preliminary cyclones atop a large cabinet-making plant.