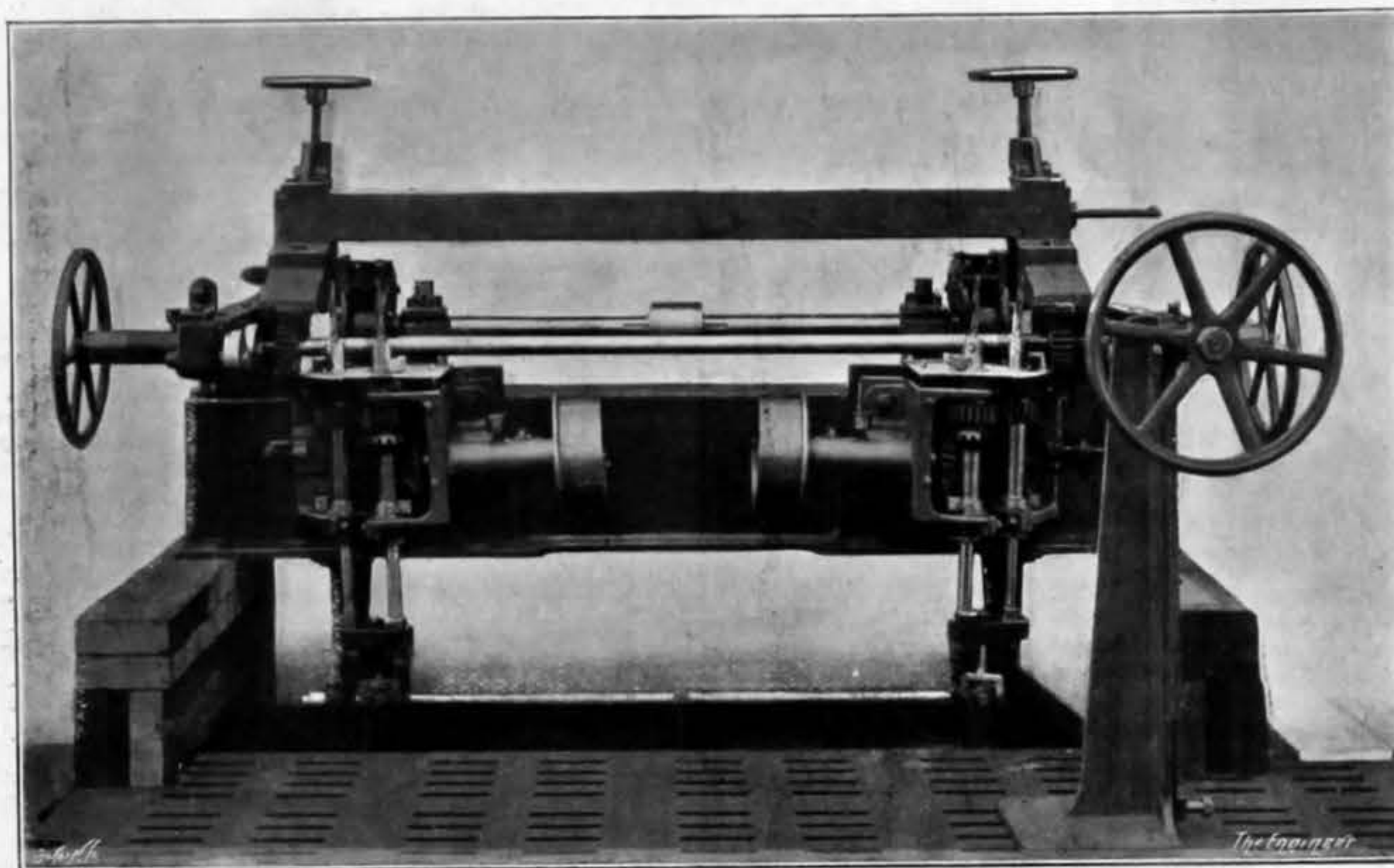


SLEEPER ADZING AND BORING MACHINE

A RANSOME AND CO., LIMITED, NEWARK-ON-TRENT, ENGINEERS



COMBINED SLEEPER, ADZING, AND BORING MACHINE.

AN improved machine, recently manufactured by A. Ransome and Co., Limited, Newark-on-Trent, for the Buenos Ayres and Rosario Railway Company for adzing simultaneously both the seatings and boring the spike holes in railway sleepers, is shown in the accompanying illustration. In practice, the sleeper is cramped upon a sliding carriage running on rollers, which is caused to pass over the revolving cutter blocks by means of two racks and pinions actuated by hand-wheels. The cutters, which are of such a width as to suit the rail, notch out both the seatings simultaneously, giving them the required bevel, and turning out the work much truer than it is possible to do by hand. An adjustable stop is provided, against which one end of the sleeper is pressed before it is cramped to the table, thus ensuring the seatings being cut in the right place without the trouble of marking them. The spike holes are bored by means of four vertical spindles arranged in two carriages. These carriages are capable of sufficient lateral adjustment to enable them to bore the holes in the necessary positions for the different curves. The four spindles are brought into work simultaneously by means of a vertical rack and hand-wheel, and are counterbalanced to facilitate the working. As the auger enters from below they bore freely, because the chips made by them rapidly fall away by gravity. Each pair of augers is driven separately. The makers inform us that the output from the machine is considerable, and that it is extremely easy to manipulate.

DOCKYARD NOTES.

A DAILY contemporary is making a great scare about guns. It is, so far as the Majestic is concerned, some six months behind the times, and the whole business is a case of the maximum amount of smoke with the minimum of fire to it. It is a species of attack upon the Elswick gun design, as the Japanese 12in. are included in the condemnation. It is laid on very thick, but the main point of the whole question—the relation between the propellant and the injured tubes—has been ignored. There is no reason to believe that any make of gun would have fared better with cordite.

THE full speed passage trials of the Australian squadron are not very satisfactory reading. The average speeds maintained between Wellington and Auckland were as follows:—

21 knot	.. Euryalus	.. averaged 21 knots
22 knot	.. Challenger	.. averaged 19.8 knots
20 knot	.. Psyche	.. averaged 17 knots

The ships are boilered respectively with Belleville, Babcock, and Thornycroft boilers.

SEVERAL German ships have recently run their full power trials. The results were:—

	I.H.P.	
Elsass	.. 16,812	= 18.74 knots
Egir	.. 5,552	= 15.54 knots
München	.. 12,388	= 23.45 knots

The decimals in each case indicate the amount over the contract. All the results are, however, maxima.

THE small German cruiser N has been launched and named Leipsig.

THE U.S. battleship Indiana has been re-boilered with Babcock and Wilcox boilers.

RUMOUR has it that a new battleship of unique design is to be laid down at Portsmouth at the end of the present year. This apparently is not the Dreadnought, but some supplementary vessel.

JAPAN—if a paragraph now going the rounds of the daily Press is to be believed—is presently to be the proud and happy possessor of a new sort of submarine which a British Admiralty foolishly declined to avail itself of, although the new boat is "all British." It is a unique craft, able to stay under water for *twenty-five days*, during which time the crew get out and walk about the ocean. We have not heard the name of the inventor, but it ought to be Munchausen.

Still there was a submarine once which stayed under for twenty-five years, and is still staying; and after all there is a more remarkable craft on the market. The invention is applied to a cutter, and at once it becomes "an instrument destined to revolutionise naval warfare." Its details are said to be "very secret." They ought to be.

THE new cruisers of the Minotaur class will be built of high tensile steel instead of ordinary steel, and the armour deck made of K.N.C. instead of the usual boiler-plates. As the armour deck is, we believe, to be nearly $\frac{3}{4}$ in. thick, someone good at fractions may be able to calculate the advantage. We are some way yet from the ideal cruiser. Two small ones—the Dupuy de Lôme and the Bayan—have been built in the past, but in the present there is but one type in existence, and that is called a battleship. We refer to the Vittor Emanuele, a ship which, on account of her excellent protection, should be able to sweep all other armoured cruisers off the sea. There could be little doubt—assuming equal gunnery, &c.—of the result of an action between the Vittor Emanuele and the Minotaur; the latter would be unable to hurt the former at most ranges, while she would stand to be very badly hurt in return. And in the matter of speed our type will apparently have little, if any, advantage. The freeboard of the Vittor is somewhat low for British needs, but she is our ideal cruiser all the same.

THE absence of rams to the Minotaur class is causing some criticism. The explanation of the fact that the 19-knot Duncans can steam as fast or faster than the 20-knot Swiftsure and Triumph now is that the ex-Chilian ships have very small rams. Those who accept this explanation are worrying about the Minotaurs.

THE submarine discovered at Port Arthur after the surrender has been surveyed and pronounced useless. This, judging by events, is a roundabout way of saying that the Russians did not spoil her like they did the big ships.

OBITUARY.

LORD GRIMTHORPE.

EARLY on Saturday morning Edmund Beckett-Denison, Lord Grimthorpe, passed away quietly at a great age, in his house, Batchwood, St Albans. He was born in 1816. Of his life as a lawyer, a politician, an architect, and a controversialist, we do not propose to speak. He was a man celebrated for his abilities, notorious as a fighter; but we cannot let his memory pass away without putting on record the fact that he revolutionised the construction of large public clocks, and incidentally produced some of the finest "regulators" ever made. To those who are versed in horology the name of Denison is a household word, but it is not difficult to make any engineer understand what it was that he effected. Clocks working pendulums are more or less accurate just as they leave the pendulum more or less alone. It is of the utmost importance that the frictional resistance of the escapement should be as small as possible; that whatever its amount, it should remain constant over long periods; and that the driving power of the clock should always be the same. It is only in this way that the length of the arc described by the pendulum can be kept nearly always the same, and always traversed in the same period. Now, church clocks must be large because they have to move big hands. Their wheelwork is coarse, and the effect of wind on the hands is very great.

In order to get the uniform driving force so essential it had long been the custom to use what are known as "Remontoir" escapements. The escape wheel is not driven by the main clock weight, but by a very small special weight or a spring. The clock has nothing to do but wind up the little weight or the spring every half minute. It matters nothing what the wind does to the hands, or how rough the main wheels may be. Every half minute they are allowed to run a very short distance, and so wind up, as we have said, the tiny special motor actuating the pendulum. The result is very good timekeeping. But Denison went one better; and instead of driving the pendulum by the teeth of the escape wheel sliding on the pallets of the "anchor," he placed at each side of the pendulum rod, high up, small weights, suspended at the ends of rods; and instead of an escape wheel he used a kind of fly, with three or six arms, accompanied by cams, in such a way that one of the suspended weights

is always elevated in advance of the rising pendulum. It is released at the end of the excursion, and falling, helps the pendulum on its return course. Thus the pendulum has always precisely the same driving effort, and there is practically no friction whatever in the escapement. The mechanism is exceedingly simple; it is very easy to make, and need not be very accurate. Clocks fitted with it are therefore splendid timekeepers.

Sir Edmund Beckett-Denison designed the great clock made by Dent for the Houses of Parliament, which is probably the finest timekeeper ever used on a public building. It is fitted with the double three-legged gravity escapement which we have just described.

Lord Grimthorpe was a great authority on bells, bell hanging and bell ringing. He was a good mathematician, and in many respects a fine mechanic. As an author, his style was excellent. Even his rampant dogmatism was not without a charm. Our readers will find it worth their while to get his treatise on "Clocks, Watches, and Bells," the first edition of which appeared in "Weale's Series" some fifty years ago. The later editions contain much interesting additional matter.

WE regret to have to announce the death of Mr. John Spencer, of Wharleton Hall, in his eighty-eighth year. He was the son of Mr. John Spencer, who established the Newburn Steel Works in 1810, and together with his two brothers, now dead, carried on these works until 1888. Mr. Spencer was highly esteemed on account of the philanthropic side of his character. He was in his eighty-eighth year, and had all his life been connected with the Newburn Steel Works. These works were among the earliest to produce steel in the North of England; they employed the Huntsman process, wherein the steel was made from cemented Swedish bars. At first mainly steel files were produced, and that on only a small scale, but the works now cover an area of over sixty acres, and afford employment to more than 1500 hands, their chief production for many years being steel boiler and ship plates. The founder, John Spencer, died in 1867, and the business was taken over by his three sons, John, Michael, and Thomas, the last named dying in 1902 at Brussels. Michael, the second son, died in 1888, when the firm John Spencer and Sons was converted into a limited liability concern with a capital of £300,000 in ordinary shares, and £300,000 in debentures. Mr. John Spencer had other industrial interests besides the steel works. He and his brothers in 1867 went into partnership with Sir W. H. Stephenson as owners of the Throckley Colliery, which is still carried on by the family. Mr. John Spencer was likewise a director of John Abbott and Co., Park Works, Gateshead-on-Tyne, as well as of Blair and Co., Limited, marine engineers, Stockton-on-Tees. His eldest son, Mr. John Watson Spencer, is the present managing director of John Spencer and Sons, Newburn Steel Works.

THE death is announced of Mr. Robert Hudson, who, during the last four-and-twenty years, had been connected with the firm of Messrs. Swan and Hunter, shipbuilders, and still more recently with the larger company in which the firm of Messrs. Swan and Hunter was amalgamated with that of Messrs. Wigham Richardson and Co. While a young man he went to Manchester, in the service of the Manchester, Sheffield, and Lincolnshire Railway Company. It 1858 he went to Sunderland as traffic manager for the old Dock Company—a company of which his uncle, Mr. George Hudson, the "Railway King," was chairman. There he remained for many years; but in 1881, when Mr. G. B. Hunter, his brother-in-law, went to Wallsend to start a shipbuilding yard, Mr. Hudson joined him as commercial manager for the enterprise. When the business was formed into a limited liability company Mr. Hudson became the secretary, and he retained that office when the two great shipbuilding firms of mid-Tyne amalgamated.

THE death has occurred at Lincoln of Mr. Thomas Bell, J.P., of Mere Hall. Mr. Bell had been ailing for some weeks, and underwent an unsuccessful operation for an internal trouble. He was sixty-five years of age, and had been a city magistrate several years. He had been connected with the firm of Messrs. Robey and Co., engineers, since 1865, originally as head of the financial department, and after the formation of the limited liability company as joint managing director with Mr. John Richardson. He retired from office about sixteen months ago, but retained his seat on the Board of Directors.

THE death is announced of Mr. John Jones, aged 78, manager of the rolling department at the large steel works at Glengarnock, Ayrshire, which occurred on Saturday evening. Mr. Jones had held the position for over eight years. Previous to going to Ayrshire he was manager of the rolling department of Messrs. Charles Cammell and Co., Penistone, for over twenty years.

THE MANCHESTER LITERARY AND PHILOSOPHICAL SOCIETY.

ON the 2nd inst. Sir W. H. Bailey, the newly-elected president of the Society, delivered his inaugural address to a crowded meeting. It is a long time since a mechanical engineer was elected president. Sir William H. Bailey very naturally took the work done in the practical application of science by members as his text. He claimed that, great as is the work done by the Royal Society, that of the Manchester Society was not less important and valuable; and he passed in rapid review the life work of Joule and Dalton, and William Sturgeon, the inventor or discoverer of the soft iron magnet. He would venture to say that the Manchester Society is great among all the scientific societies as having had the largest number of mechanical inventors as members; for Lancashire is the birthplace and Manchester is the metropolis of modern mechanical inventions, this county being the first to use steam power for spinning and weaving, as well as to use the invention of James Watt for cutting, slicing, shaping, and altering the old handicraft tools to suit the new power.

It is interesting to note the number of names of men who did the world's scientific work in past years, and who were more or less connected with Manchester; such, for example, as Priestley; Wilkinson, who invented iron boats; James Watt, Boulton, Fairbairn, and others. Sir William Bailey concluded an able address with the following words:—"We have every reason to be proud of our Society's noble history and of our ancient meeting house and of its library—which is probably the best scientific serial library out of London. This library has been and is of great value to its members, and I feel that I am doing what is proper to this great district, whose every prosperity consists in the partnership between science and industry, in asking our members not to forget what they own."

THE length of electric railways in Canada on June 30th last was 767 miles, of which 376 miles was in the province of Ontario and 254 miles in Quebec.