



plant last year. Besides several large structures devoted to the actual manufacturing processes are a number of separate buildings, including the offices, the enormous storage sheds, the stables, etc. The various buildings are connected with each other by a tram system which extends to all parts of the premises.

The mechanical equipment has kept pace with the progress of recent years, and in every department the latest and most approved machinery is in use. The motive power is supplied by two large compound horizontal

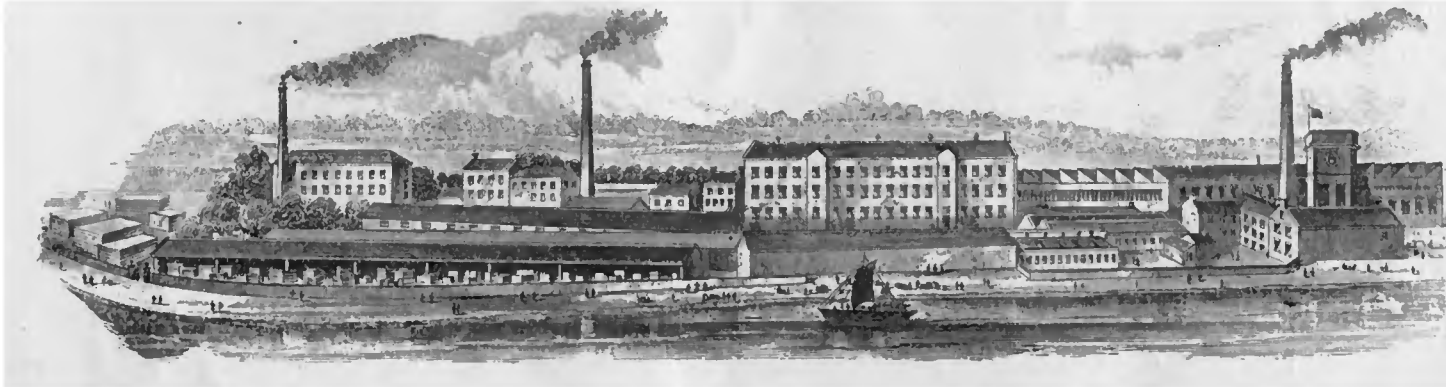
Indeed, nothing seems to be left undone which could facilitate or safeguard production. It should be added, in passing, that the male and female operatives are confined to separate departments, and that every stage of the work is carried on under the most wholesome conditions attainable, the sanitary arrangements and the general comfort of the workpeople having been carefully considered.

While it would be impossible to give in limited space anything like a detailed description of the various processes of manufacture,

portion of whom are machine hands, performing the various operations of shaping, smoothing, and carving the sticks. The saw-mill, where the rough timber is reduced to proper dimensions preparatory to seasoning, the stick-bending rooms, the varnishing and staining room, the packing room, and the stock room are also noticeable by reason of their size and completeness. Connected with the works are well-equipped carpentering and fitting shops, where repairs are executed, and where much of the special machinery in use is constructed.

Messrs. Harrison and Company's manufactures include umbrella sticks and handles in wood and celluloid, with mountings and fittings to order; and walking sticks in Congo, myrtle, furze, bamboo, cherry, hazel, orange, and other native and foreign woods. In their large stock room may be seen at one time as many as 14,000 samples, representing every conceivable design. In addition to their large stock always at the manufactory the Company also maintain offices and stocks in London, Manchester, Glasgow, and Paris, their

manufactures being distributed from these centres to almost every part of the world. It is but just to add that under Mr. Harrison's direction the works have fully maintained their long-established and world-wide reputation as one of the leading concerns of the kind in the kingdom.



"BLISS MILLS," A. C. Harrison & Co., Chalford, Near Stroud.

steam engines of 46 h.-p. each (designed and constructed by a Gloucestershire engineer), and by a water-wheel, which can be coupled with the engines. The premises are lighted by electricity generated on the premises, are provided with the Witter automatic sprinkler system throughout, and are steam-heated.

it may be proper to refer in a word to one or two of the more interesting departments. The general turning and making department is an admirably lighted room, 110 by 80 feet in dimensions, and is undoubtedly one of the finest workrooms in the county. Here are employed about one hundred operatives, a large pro-



HATHERLEY WORKS, GLOUCESTER.

The largest Step Works in existence.

IN 1885 Mr. Charles Allan Jones, the founder and present sole proprietor of the Hatherley Step Works, began the manufacture of his patent step ladders, which have since become so widely known throughout Great Britain and the Colonies under the coined word "Lattisteps." The industry was begun on a very small scale, with a nominal capital, and without mechanical equipment, in a building forty feet by twenty-five feet.

To-day the works, which are noticeable by reason of their excellent arrangement and construction, as well as their size, cover 2½ acres of ground, while the wood-working machinery is of the most complete character. One department alone, the mill, is 170 ft. long by 90 ft. wide, and others are scarcely inferior. As the business grew, other originalities were added, including various kinds of folding tables, cycle stands, trestles, poultry houses, etc., although the "Lattisteps" remain the leading feature of the works, and 15,000 of them are always kept in stock, a figure which gives some idea of the enormous number manufactured and sold.

It should be added that Mr. Jones is now not only the largest manufacturer of step ladders in the world, but that he was the first, at least in Great Britain, to make the manufacture of this one article—registered trade mark "Alhathlat"—the basis of a separate industry.

In several respects the Hatherley Step Works may be fairly taken as a type of our best industries. This is particularly true as to the attention given to promoting the comfort and efficiency of the work-people. All of the departments are light, clean and roomy, and are steam heated, the operatives working under the best conditions attainable. It is a pleasure to state that in the history of the industry there has never been a labour dispute, and what is even more remarkable, no operative has ever been suspended for want of work. In all of the departments labour is highly specialized, each man confining himself to that operation for which training or natural aptitude has best fitted him.

The Works are conveniently placed, having entrances in three streets. They are provided throughout with a most unique and original tram system, by which the product is carried on trucks through every department from the timber yards to all floors of the warehouse without lifts. All the trucks, points, crossings, turntables, etc., are specially designed and manufactured on the premises, the rule being that all materials in the process of manufacture shall remain on wheels until finally deposited in the warehouse.

All departments are lighted by electricity generated on the premises. The Grinnell sprinkler system is installed, and in the smallest detail, even in the office methods, the industry has been developed along the most progressive lines, nothing being left undone which could promote economy or despatch. Mr. Jones personally supervises the works, while Mr. R. D. Wyatt, General manager, attends to the commercial interests.

In addition to the large ware rooms at the works, store depots are maintained in London, Liverpool, Leeds, and Glasgow, and an agency has been established at Durban, Natal, with Mr. W. Percy Williams as representative.



JAMES CONSTANCE & SONS, LONGHOPE, NEAR GLOUCESTER.

**General Wood Turners and Manufacturers
of Prong Stems, Hay Rakes, etc.**

MESSRS. JAMES CONSTANCE AND SONS' manufactory at Longhope, near Gloucester, has been in successful and continuous operation for considerably over a century, having been established in 1788, on the site of the present premises. The industry was established by a grandfather of the present senior member of the Company, and during its entire history has remained in the hands of the members of the same family. Gloucestershire furnishes but few instances in which an industry has been carried on for a longer period, or with more success, by one family.

Owing to the fact that the larger part of their manufactures go to many parts of England, comparatively little being used in the county, but few even of our own people have any idea of the extent and importance of Messrs. Constance and Sons' industry. It is perfectly accurate to say that they are, without exception, the largest manufacturers of their exclusive lines in the county or the district. Their premises cover a large area, one-fourth of which is under roof. Nearly all of the buildings are modern, and comprise a number of separate store and ware rooms, as well as the large departments in which the actual manufacturing processes are carried on. The mechanical equipment is thoroughly up-to-date, including circular and band saws, drills, and a great number of turning lathes of all sizes, the largest being capable of turning handles to twelve feet in length. At the present time about forty operatives are given employment. It is interesting to know that a number of the operatives have remained with the Company for many years—in some cases for thirty or forty years—a fact which sufficiently illustrates the kindly relations existing between employers and employed.

Messrs. Constance and Sons manufacture a great variety of turned wood, including brush, broom, mop, hoe, rake, oval, hammer, sledge, spade and shovel, collier's peck, and other handles, scythe sneads, washing dollies and peggies, wood shives, cider bungs, spreaders, ladder rounds, and many other articles. Among their specialities should be mentioned their hoe, prong, and hay rake handles, of which they make thousands each season; scythe sneads, which go principally to Sheffield, where the blades are made; complete hay rakes, considerable quantities of which are sold in a large number of counties; all classes of turned brush work, much of which is used in the Worcester, Bristol, Gloucester, Birmingham, and Midland brush factories; and washing dollies. Large stocks of all these articles are kept in reserve at all times, so that any order can be filled at short notice.

The process of manufacture of the various articles is very interesting, and the visitor is surprised to find that almost every article



must go through a number of hands, and frequently a number of machines, before it is complete. Throughout the works labour is carefully specialised, each workman confining himself to one particular operation or kind of work, thus gaining a rapidity and accuracy which he could not otherwise acquire. Much of the work requires an accurate judgment on the part of the workman, as well as considerable skill. Thus in splitting the log from which a prong stem, rake, hoe, or other handle is to be made, advantage must be taken of the shape and grain of the log to avoid waste and to secure the best result, and in bending or straightening, shaping, and turning the greatest care must at all times be exercised.

Messrs. Constance and Sons obtain their supply of timber—which includes ash, alder, beech, birch, and other woods—principally from the Forest of Dean, Herefordshire, Monmouthshire, and Shropshire. All of the rough timber is stacked in the yards and thoroughly seasoned before being used; and in many cases, after being split and sawed into lengths, it is again seasoned for months. This care is characteristic of their methods throughout every stage of the work, from first to last. Their entire reputation has been established on quality. American or other competitors may make a cheaper article, but it is not too much to say that no firm has consistently maintained a higher standard.

The present members of the Company are Messrs. Stephen W. Constance (the senior member), and his sons, W. J. and John Constance, all of whom devote their whole time to the business. Although their industry is more than a century old, it is still thriving and progressive, and it has been a pleasure to refer to the thorough and conscientious methods which characterise its management.



IRELAND AND COMPANY, GLOUCESTER.

Wholesale and Export Brush
Manufacturers.

MESSRS. IRELAND AND COMPANY'S brush manufactory, New Inn Lane, Gloucester, has been in continuous and successful operation for considerably over a century, having been established in 1767. The original premises were in Westgate Street, and after several removals to more convenient quarters, made necessary by increasing trade, the present commodious premises were secured in 1869.

As is the case with several of Gloucestershire's industries, the appearance of the Company's factory is but little known, even to our own people, as it is so surrounded by other business premises as to be almost obscured from the view of the casual observer. The buildings, however, are quite extensive, with a frontage of 38 feet, and large workshops of modern construction in the rear. In recent years several important additions have been made, including a roomy and substantial two-storey building erected last year. Immediately opposite the factory is a separate building, 70 feet in depth, used exclusively as a warehouse.

Brush making in Messrs. Ireland and Company's factory is highly specialised, the factory being divided into a number of separate departments, in each of which only a portion of the work is done. Among the departments are the "pan room," where sweeping brooms, bass brooms, hearth brushes, bannister brushes, etc., are made; the drawing room, for

scrubbing brushes, stove, shoe, dandy brushes, etc.; the finishing room; the varnishing room; and several large stock rooms. The factory gives employment to between 25 and 30 hands, whose productive power is increased by the use of special machinery and appliances. All of the operatives work under agreeable conditions, the various departments being well lighted and ventilated and thoroughly comfortable.

Almost as interesting as the various hand and machine processes which enter into the making of every brush are the large stock rooms in which the component parts are stored. In one large room are thousands of backs and handles—enough, one would imagine, to supply the trade for years. In other rooms are kept large quantities of assorted fibre and bristles, varying in fineness from those used for paint brushes to the heaviest and coarsest pavement and street brushes. Many of the bristles are imported from the most distant countries, Russia, Siberia, China and India contributing largely to the stock, the price for some varieties ranging as high as 12s. per pound. All of the fibre is also imported, principally from South America, Mexico and Africa. Thousands of pounds of fibre and bristles are always kept in stock, to enable the Company to promptly meet any order.

Messrs. Ireland and Company manufacture almost every variety of brush known, though they have for many years paid special attention to the manufacture of the best quality brooms and brushes for household purposes. They also keep men specially engaged for all classes of mill work. Their trade extends throughout the Midlands, the West of England and South Wales, where their reputation has long been firmly established. It is worth noting that they have never advertised, their wide connection having been secured and maintained wholly through the invariably high quality of their manufactures.

The present members of the firm are Messrs. G. H. Harris, R. J. Templeman (manager), J. G. J. Lane, and A. S. Lane, all of whom devote their entire time to the management of the business. Of these Mr. Harris has been identified with the business continuously for thirty-four years, and Mr. Templeman for thirty-two years. It should be added that during its long history of nearly 140 years the business has never been suspended for lack of work, and that under the present management its high standing is being fully maintained.



S. J. MORELAND AND SONS, GLOUCESTER.

Manufacturers of the Celebrated
"England's Glory" Matches.

MESSRS. S. J. MORELAND AND SONS' match works (one of the largest and most interesting industries in Gloucestershire) were established over fifty years ago by Mr. S. J. Moreland, the present senior partner of the Firm. The business was begun on a small scale, on a site near that now occupied in Bristol Road, and the original premises would be lost in those required to-day.

From the date of its establishment until the present time the distinguishing feature of the industry has been its unbroken growth. Fifty years ago match-making was undeveloped, and both the methods of manufacture and the product were of the crudest description as compared with those of to-day. But, like nearly all industries, the manufacture of matches has been completely revolutionised by modern science and invention, and the highly

specialised machinery now in use has enormously increased the output, and at the same time minimised the cost. In this development Messrs. Moreland and Sons have taken a very important part, and many of their machines and special appliances are of their own invention.

Co-incident with the constantly increasing demand for the Firm's matches the buildings and mechanical equipment were frequently enlarged, the premises, including the large timber yards on the canal side, now comprising an area of six acres. The buildings are of the most substantial construction, and are provided with every convenience which long experience or forethought could secure. They are lighted by electricity, and are equipped with the automatic sprinkler system throughout. The works are entirely self-contained, comprising, in addition to the actual manufacturing departments, carpentering and fitting shops and a complete printing plant.

It is but just to add a word here as to the conditions under which the operatives (of whom there are upwards of 1,000) perform their work. The buildings are admirably lighted and ventilated, and are heated with hot air, thorough ventilation being secured by means of fans. Every effort has been made to ensure the comfort and health of the workpeople, and that this object has been attained is evident to anyone who is privileged to inspect the works.

It would be wholly out of keeping with this brief article, as it would be beyond our powers, to attempt anything like a technical description of the various processes in use in Messrs. Moreland and Sons' works. It is interesting to know, however, that such is the rapidity and precision of their special machines that in less than an hour a rough piece of timber is converted into the finished article. One of these machines, into which is placed sheets of wood of the proper thickness, turns out the completed splints at the almost inconceivable rate of 12,000,000 per hour, and another machine has a capacity for turning out over 700 boxes per minute. Other processes are not less rapid, and in the course of a single day tons of wood are converted into finished matches, packed in boxes and ready for shipment.

Messrs. Moreland and Sons manufacture all kinds of Safety, Paraffin, and Vesuvian Matches, and Wax Vestas. Their safety matches, which were introduced a few years ago, are appropriately named the "John Bull" brand, and, like the other products of "England's Glory" match works, have gained a world-wide popularity.

It is perfectly accurate to say that the products of no other manufactory in Gloucestershire or the West of England are known in so many homes in various parts of the world. The "England's Glory" and "John Bull" matches are not only familiar words in every British household, but they are in daily use in all our Colonies and dependencies, and in other countries. Wherever they go they are a favourable advertisement for Gloucestershire manufactures.

There is another very commendable feature of Messrs. S. J. Moreland and Sons' great industry to which we should refer in conclusion. The Firm have declined to become a part of any combine or syndicate, but, on the contrary, have held their own, and have consistently combated monopoly. The present members of the Firm are Messrs. S. J. Moreland (the founder of the industry) and his two sons, Messrs. Harry and Philip, all of whom devote their entire time to the business.

