

Machinery and Appliances.

A NEW COTTON MILL IN BOMBAY.

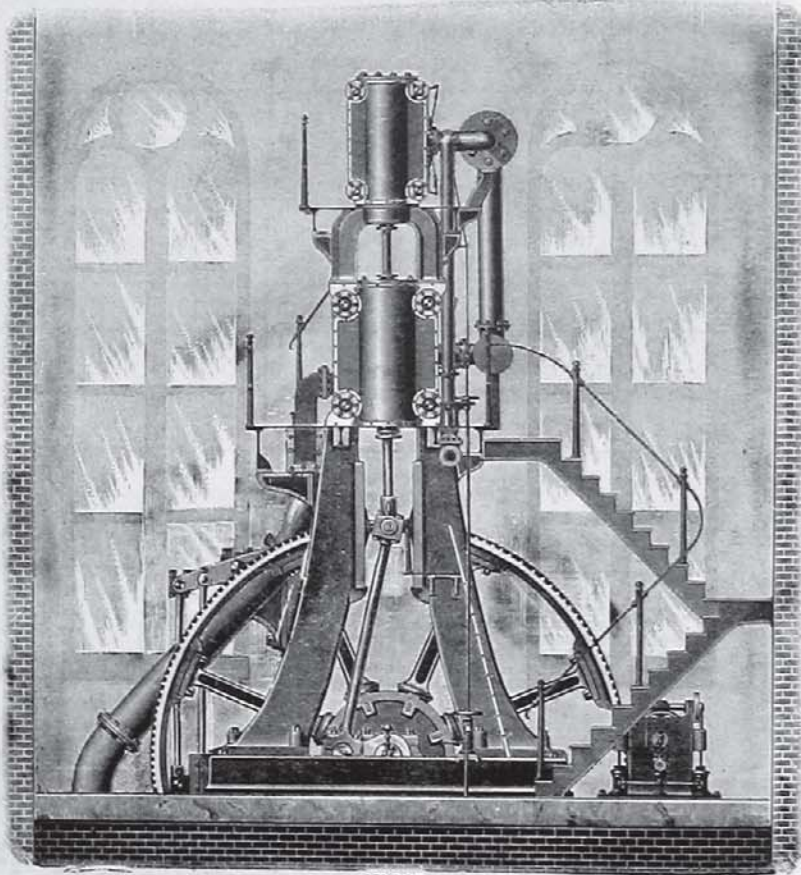
We have already frequently called the attention of the readers of *The Textile Mercury* to the rapid growth of the English system of cotton manufacturing in our great eastern dependency, India. The West derived from that country its first knowledge of cotton goods, which were brought overland and distributed amongst the countries bordering the eastern half of the Mediterranean for several centuries before they found their way into France, Germany, Holland, and Great Britain. After the discovery of the Cape route to the East the intercourse between the west of Europe and India considerably increased. It was not, however, until the English East India Company had secured a firm footing in the Peninsula, and had begun to import Indian manufactures in considerable quantities, that cotton fabrics grew to be fashionable in the richer classes of English society, displacing the rough woollen and linen fabrics of home production. This displacement of home productions attracted popular attention, and produced a considerable outburst of opposition, the sentiment being frequently manifested during the first thirty years of the last century. It was all, however, of no avail; cotton goods continued to be worn more and more, with the result that endeavours were made to imitate them. Cotton had been known and imported from Smyrna, and used for candlewick and lamp purposes for several centuries, but it was spun into yarn only to a very small extent, if at all, until the endeavour was made to imitate Indian cotton goods by using it as weft for insertion into linen warps. In this way its use continued to extend and steadily increased, until the inventions of Hargreaves and Arkwright gave it the wonderful impetus which constituted the true beginning of our modern cotton industry. When Samuel Crompton, of Bolton, combined the leading principles of Hargreaves' and Arkwright's inventions in the mule which he constructed and operated at the Hall-i'th' Wood near that town, he accomplished something out of which, in imagination, might have been heard ringing the knell of the primitive cotton industry of India. It was not long after this that English and Scotch muslins were fabricated so extensively as to be exported to India and sold in competition with the native productions. What the trade thus originated has since become, our readers know well enough.

The endeavour thus made to emulate the fineness of Indian fabrics, gave a powerful stimulus to the inventive genius of Lancashire and in its primary and secondary effects it has revolutionized the industry and commerce of the world. In the struggle between the old and the new systems, the former—represented by the primitive spindles and looms of the Hindus—naturally went to the wall; the course of commerce was reversed, and India, which for centuries sent its calicoes and muslins to the West, was beaten out of the field by the products of Lancashire and Glasgow. For half a century there has been an ever-increasing volume of English manufactures going to our eastern dependency, and this has given birth at last to the idea of bodily transferring English machinery and the English system of manufacturing to the original home of the cotton

trade. This has been done, and important as have been the results up to the present moment, it is too probable that as yet we only see the transplanted system in its veriest infancy. With what has been accomplished our readers, through these columns and other sources of information, are already well acquainted. The rate of expansion of the new industry is now more rapid than ever, and both native and English capital is steadily flowing into the business as a promising investment. The development of the new industry in India has been mainly on the lines of the Joint Stock system, which has been so successful in Lancashire. Nearly all the important mills are limited companies, and the extensions taking place are on the same principle.

Amongst the most recent new mills may be mentioned "The Sun Mills, Limited," Bombay,

ing, pulleys, and gearing. The only stipulation of the purchaser, at the time of making the contract, was that everything should be the best of its kind. The standing and reputation of the firm who have executed the work is a sufficient guarantee that this has been complied with. We have much pleasure in presenting herewith three beautiful illustrations which convey a very accurate idea of the latest example of the skill of the firm in engine design and construction. The engines, as will be observed, have four cylinders, the high pressure one being of 16in. diameter; the intermediate one, 25in. diameter; and two low-pressure, 28in. diameter with 3ft. 6in. stroke. The expansion takes place in four cylinders instead of, as is usual, in three. The steam expands in the high pressure cylinder, and exhausts into the intermediate; it then expands here, and exhausts simultaneously into the two low pressure cylinders



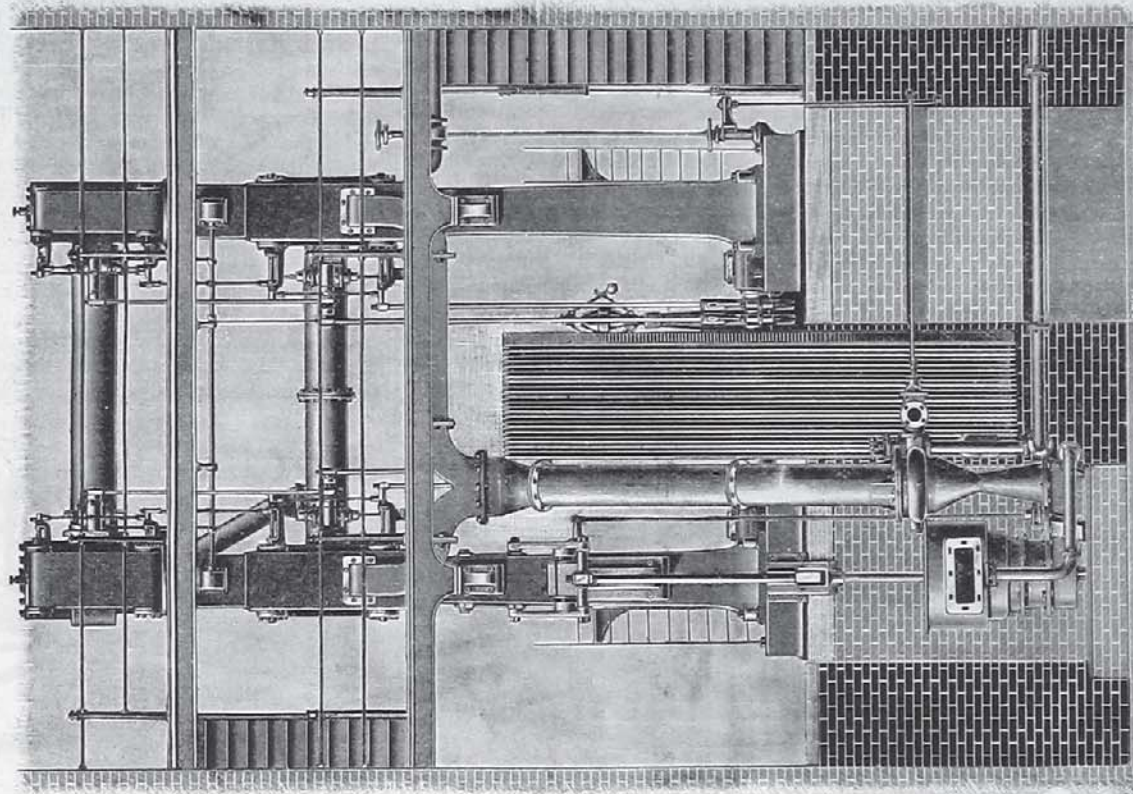
No 227

NEW TRIPLE EXPANSION ENGINE. FRONT VIEW.—MESSRS. J. MUSGRAVE AND SONS, LTD., BOLTON.

a name obviously borrowed from that of a successful and celebrated establishment in Oldham. This commenced operations in December last, and we have much pleasure in presenting our readers with some details relating to it. It is a three floor building, ground floor and two upper stories; it is constructed on the most approved modern principles, and is intended to contain, when filled, 30,000 spindles and preparation. The owners, on the recommendation of Messrs. Soorabji Shapurgi and Co., the well-known engineers of Bombay, have adopted vertical triple expansion engines of a new type. These have been constructed by Messrs. JOHN MUSGRAVE AND SONS, the eminent engine builders, of Bolton, Lancashire. They are the first of their kind introduced into India, and constitute part of an order for a complete engineering outfit for a spinning mill, which included boilers, economisers, shaft-

This is the novelty in the construction of these engines; the expansion taking place three times, but being effected in four cylinders. The advantages gained from this arrangement are, that it permits the fly-wheel to be placed in the centre of the crank shaft, between the two engines, and by the exertion of an equal amount of power from the two low pressure cylinders thus secures more uniformity of speed and even driving than has hitherto been possible, as it enables the load to be more nearly equally driven from both ends of the crank shaft. This of course, is a very essential quality in the motive power of spinning and manufacturing establishments.

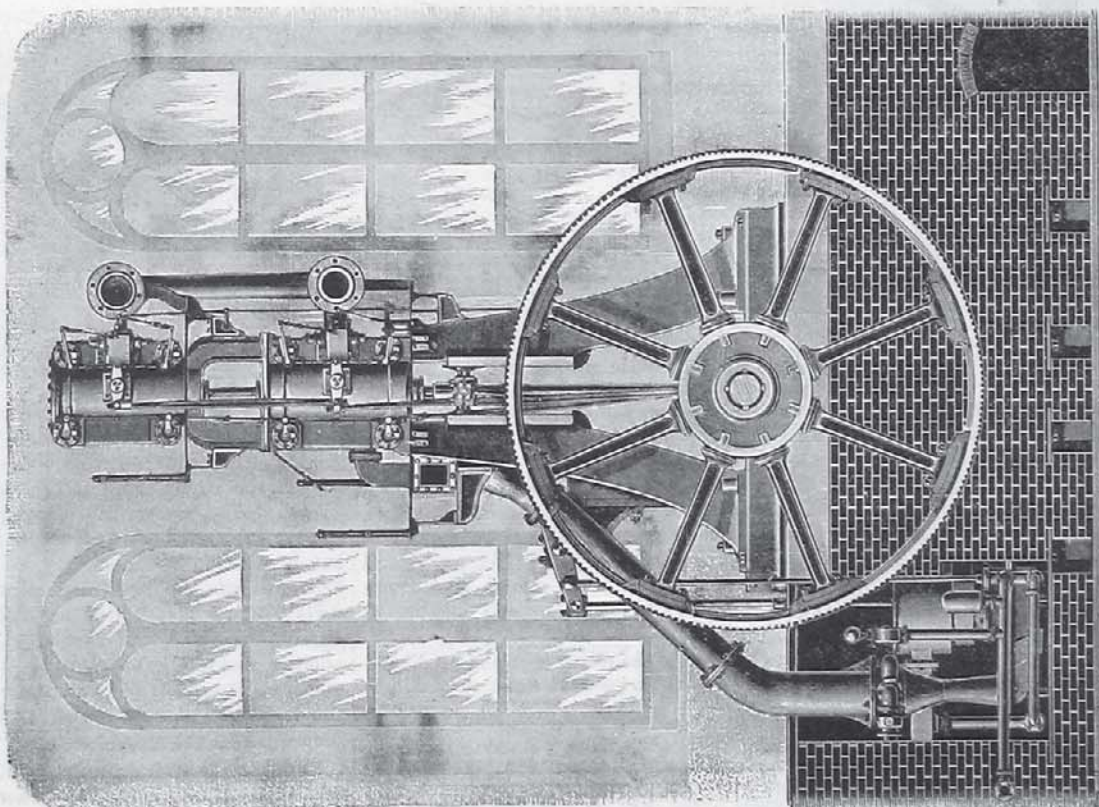
The low pressure cylinders are firmly secured to the standards, which are of very strong proportions, and are spread well out at the base and secured to strong bed plates of cast iron. These are made much stronger than usual with



677 22 16/10/90

No 220

EXP. VIEW.



677 22 16/10/90

No 228

VIEW SHEWING VALVE GEAR.

NEW TRIPLE EXPANSION ENGINE.—MESSRS. JOHN MUSGRAVE AND SONS, LTD., BOLTON.

this type of engine, thus securing great steadiness and making the engines practically independent of support from the walls of the engine-house. The high-pressure and intermediate cylinders are carried upon strong cast-iron chairs secured to the upper portion of the low-pressure cylinders. The cylinders are surrounded by stages of ample size, so that access can be freely obtained to all the various parts; small stages are also provided for the convenience of oiling the slides, &c.

All the cylinders are fitted with Corliss valves actuated by Messrs. Musgrave and Sons' well-known Corliss valve gear. The valves of the high pressure and intermediate cylinders are both controlled directly from the governor. The latter is of Messrs. Musgrave and Sons' improved high speed type, and in order to secure the greatest uniformity of speed with varying loads, the governor is provided with one of Higginson's patent mercurial regulators.

results, whilst it takes up less space than those of the ordinary form.

The fly-wheel is grooved for the reception of ropes by which the power is transmitted, and is 18ft. diameter, having 22 ropes 1½ in. diameter. The wheel is built up in segments, having separate arms and boss; the latter is bored out to receive the arms, which are secured by cast-iron cotters.

The mill has commenced operations with about half its complement of machinery, which has been supplied by Messrs. ASA LEES & Co., LIMITED, Oldham, a firm whose name needs only to be mentioned to be an assurance of its high quality. It consists of the following:—1 Holt's willow; 1 double Crighton opener; 6 single lap machines; 33 single carding engines, 40 in. on wire; 15 drawing frames 1 head of 7 deliveries each; 5 slubbing frames, 3 of 84 and 2 of 78 spindles each; 7 intermediate frames, 114 spindles each; 14 roving frames, 144 spindles

NEW PATENT BRIDGE HANK-DOFFING MOTION.

MR. JOSEPH STUBBS, MAKER, MILL-STREET WORKS, MANCHESTER.

Reeling is a well-known process in the preparation of yarn for bleaching, dyeing, printing, or bundling. Originally, when reels were smaller than now, the hanks as they were finished were doffed by the attendant lifting one end of the reel swift out of its bearings, and thus passing them off the swift. This, however, involved time, labour, and great risk of staining the hanks with the oil upon the bearings. This primitive method was superseded somewhat over thirty years ago by the invention of an arrangement still extensively in use, known as the wheel doffing motion, which originated in Mansfield, and was a great improvement upon the old method, though experience shewed that it did not completely remedy its deficiencies.



IMPROVED COP REEL.—MR. JOSEPH STUBBS, MANCHESTER.

The results obtained with this governor and the regulator mentioned, as shewn by the Moscrop recorder, have always been highly satisfactory.

The crank shaft is of the best quality of Martin-Siemens steel, with necks 11 in. diameter and 22 in. long. The cranks are of wrought iron fitted with mild steel crank pins 6 in. diameter and 7½ in. long. The crossheads are of hammered scrap iron, provided with cast-iron slippers having ample wearing surface. The piston rods are of mild steel 3¼ in. diameter at top, and 4½ at bottom, and the pistons are fitted with Buckley's patent packing. The air pump is vertical, and single-acting, 28 in. diameter and 16 in. stroke, and is driven from the cross head by means of polished wrought-iron levers, centred upon a strong cast-iron bracket, secured to one of the standards. The barrel, bucket, and valve grids are of brass, provided with india-rubber valves. The condenser is of the makers' improved injector type, which has been found to give the best

each; 14 self-acting mules, 804 spindles each, 1¼ in. gauge; 6 self-acting mules, 736 spindles, 1½ in. gauge.

From these details and the accompanying illustrations our readers will readily conclude that these engines constitute a piece of work of which the makers may justly feel proud, and which can hardly fail to extend both their reputation and business.

In reference to the rating of cotton machinery for income-tax purposes, the usage in Oldham and Blackburn is 7½ per cent. off machinery, 5 per cent. off boilers, engines, gearing, &c., and nothing off buildings, as they stand in the books on the 1st January in each year. The Bolton spinners consider the allowance should be not less than 5 per cent. on the first cost of machinery, boilers, &c.

The directors of the Kempton (Bavaria) Cotton Spinning and Weaving Company have decided to propose a dividend for last year at the rate of 11½ per cent. The dividend for 1888 was at the same rate.

About fourteen years ago Mr. Joseph Stubbs, the well-known maker of winding, reeling, and gassing machinery, directed his attention to the subject, the result being the invention of the "gate" doffing arrangement which was a further improvement, and which since its introduction has been steadily supplanting its predecessor. Still the gate doffing arrangement was not as perfect as its maker desired, and in the endeavour to effect still further improvements, another method was invented about twelve months ago, which has received the name of the "Bridge" doffing arrangement. This is the subject of the present notice.

In the accompanying illustration we shew the application of this invention to a cop reel. It may be desirable though almost superfluous to add that it can be supplied with any description of reel. The end of the frame at which the doffing takes place, as will be observed, is open and carries two standards, the rear one supporting the reel swift when in its working position.