

pigmy, but intelligent engine-man, as is the small engine in a factory.

"The quantity of water pump'd up for the supply of London daily, amounts to 115,000,000 gallons. Of this enormous quantity 79,000,000 gallons are pumped by means of single-acting engines on Harvey's plan. In fact, the reputation of this firm for gigantic pumping-engines is world-wide. Those who have time to visit Battersea and Leabridge, where the originals of the models referred to exist, would find that they were amply repaid for their trouble by an inspection of them.

"Speaking of water-works we are reminded of the fine specimens of fire-engines exhibited in the Western Annexe. And after the experience of the past year or two in the Metropolis with respect to fires, and the recent report of the Select Committee which has sat on the subject, he must be a bold man who will say that fire-engines are not an important feature in the world's show at Kensington. Every witness examined, including the managers of the Brigade, has admitted—what we long since asserted—that the present state of the staff, engines and stations, is totally inadequate for the protection of London from fire.

"An altered and expanded arrangement in respect to the London Fire Brigade, will unquestionably demand a commensurate improvement and increase in the number of fire-engines. Of steam fire-engines the metropolis has but a scanty supply and we may suggest that attention should be paid to the subject by engineers and others interested in it.

"Messrs. Shand and Mason, Roberts, Merryweather, and others, figure the most largely in this department, but, as we have said, the display is meagre. The American steam fire-engine, forwarded by Mr Hodges, of the Lambeth Distillery, we have before spoken of, but why it should be placed in a corner, where it is difficult for its merits to be disclosed, is a question for the Commissioners, whose ways are difficult to comprehend or account for.

"We come now to a consideration of some of the manufacturing machines and tools. Cotton spinning machinery is largely represented, and Messrs. Dobson and Barlow, of Bolton, contribute a fair quota of the whole. They exhibit, in fact, a series of machines for opening and cleansing, preparing, and spinning cotton. The whole of these are replete with the most modern improvements of detail, and they may be briefly mentioned in the order in which the operations named follow each other in ordinary working. The first is named a cotton-spinner, and is adapted for spinning and cleansing long or short shaped cotton. The feeding parts and the inside gratings, are of a novel construction, the object in view being to open out and clean the cotton without injuring the staple. The second is called the single scutcher, and is supplied with feeding rolls, which have been patented by the firm in question. The merit of the rolls consists in their holding the cotton sufficiently firm without breaking the seeds or shells. Then follows the breaker carding-engine, which is a combined patent machine; Wallman, of the United States of America, and Dobson and Barlow, each having a hand in it. Its chief merits are that the cotton is well opened and cleaned by the working rollers,

before the upper rollers will allow it to pass the self-stripping top flats. These flats can be taken out at pleasure by the attendant, and re-adjusted without the use of a screw key. A finisher carding engine stands next, and it works automatically—an improvement on the plan of stripping flats by hand as is usually done. Ashworth's patent lap machine is used for making laps for the finisher carding engine, and combing machine, and a grinding apparatus is so contrived as to grind two rollers and a flat at the same time.

"Then follow five frames, known respectively as the drawing frames, with forty-four spindles, each ten inches by five inches; the intermediate frame with fifty-four spindles, each eight inches by four inches; the roving frame of seventy spindles, each seven inches by three and a half; and the jack frame of eighty-eight spindles, five inches by two and a half.

"The patent self-acting mule, of Dobson and Barlow, makes the total of the cotton-spinning arrangements at the exhibition of that firm. This last presents numerous peculiarities, and the whole of the machines are well fitted up.

"Platt, Brothers, & Co., of Oldham, figure most extensively in the same branch of manufacturing industry, the space devoted to their machines and contrivances being very large. As the Illustrated Catalogue, Part III, however, does elaborate justice to their cotton working machinery, we need not further refer to it than to say it reflects the highest credit upon the firm, who must have gone to very great expense in forwarding the whole to London, and keeping a large staff of workmen and girls to attend it.

"The cotton machinery of Messrs. Hetherington, of Vulcan Works, Manchester, is not inferior in many parts to that we have already referred to, and, indeed, it will not be the fault of the great firms of the Midland districts, if visitors to the International Exhibition do not gather much valuable information as to the treatment of that vital element of industrial labour—cotton.

"The paper making and paper cutting machines of Messrs. Bryan, Donkin, & Co., of Bermondsey, are suggestive of the immense consequence of the material with which those machines have to deal. This firm have earned a well-established reputation for the excellence of their paper making and dressing machinery, and the gigantic well-finished specimens of their work in the Western Annex prove that they are likely to maintain their fame.

"The Western Annex is, as we stated on a former occasion, extremely rich in specimens of engineering tools, and, perhaps, in this respect Messrs. P. Fairbairn & Co., of Leeds, make as distinguished a show as any. The radial drilling machines exhibited by this firm are excellent specimens of their productions in the tool department, and their universality of application, must make them invaluable in the erecting shops of the engineer and millwright. Of lathes, planing, and slotting machinery, too, they contribute excellent examples.

"In engineering tools of a, generally speaking, less massive kind than those of many of his neighbours, Mr. Whitworth, of Manchester, is largely represented. His lathes, which are so generally used by engineers, not only at home, but abroad, are to be found in every variety at the Exhibition.