

There are numerous specimens, also, of drilling and slotting machines, all of which are distinguished by the excellence and exactitude of fitting, which have obtained for Mr. Whitworth a world-wide fame. The wheel cutting machine exhibited calls for especial remark. Those who are aware of the tediousness which attended the operation of chipping and trimming wheels by hand, and the chances which there were, after all, of the teeth being out of pitch, cannot but appreciate the value of this contrivance. It may be made to deal with either metal or wood, and with both spur and bevel gearing. It will cut the teeth or cogs of wheels up to ten feet diameter, and those of pinions down to the smallest size and pitch, and with the certainty of truth and uniformity.

"We spoke but now of the importance of paper; and nearly allied to it in importance is printing. Messrs. Petter and Galpin give us, in the Western Annex, an excellent example of what has been done in the shape of printing machines, and an idea of what may yet be expected; but it remained for the "Type Composing and Distributing Machine Company" to furnish visitors to the Exhibition with an apparatus intended for facilitating the work of the Compositor.

"The machines shown are the invention of the late Mr. James Hadden Young; and, as a plea for their use, we are told that while printing from the composing types has, by the improvements in the steam press, been carried to a most advanced stage, yet that setting up by hand is not done more quickly than it was 400 years ago, by the earliest printers. This certainly develops a *prima facie* case for stimulating the creative powers of mechanical inventors; but we are not quite prepared to say that the machines in the Annex are successful exemplifications of inventors' powers in this direction.

"A suppositious state of things has been assumed with a view of setting forth more clearly the inestimable value of the type composing and distributing machine, and it is this: Let it be imagined that half an hour before usual time of putting to press, news arrives at the office of a daily journal, which would extend in the telling over three of its columns. This would involve the setting of something like 45,000 types, and in order to accomplish it a staff of ninety compositors would have to be employed. Each of them would have a scrap of paper put into his hand to set up in such a manner that it may tally with his neighbour's piece, technically called "making even." This would, undoubtedly, be a heavy piece of work, and one in the execution of which errors would be likely to creep in. Well, if all be true that is told of the machines named, they would make very light work of it. With them the task would be accomplished by six "players," and twenty-two justifiers in the same time, and only six pieces of copy instead of ninety would be required. The chances of error thus would be lessened.

"The type-composing machine is provided, something after the manner of a pianoforte, with separate keys for all the letters of a fount. This admits of each letter being set up in the order required by the compositor's copy, with a speed which is only limited by the eye and fingers of the player. The art of playing the machine, or as we should

prefer terming it, working it, is said to be acquirable by a compositor, with the short noviciate of a few weeks' practice.

"As the type composing machine sets up the type in long lines, Mr. Young invented his "justifying apparatus," which is intended to replace the compositor's stick, an implement it, however, resembles. This is fixed to a frame, and is used as follows:—The compositor places the galley filled with the long lines set up at the composing machine. He fixes one of these lines into the proper apparatus, divides it into its proper length, reads it, makes corrections, and having justified it, he moves a handle, by which the completed line is depressed, and room is made for a succeeding line. It is found that a skilful compositor can justify at the rate of 4000 types per hour.

"As we have said, the whole of the arrangements connected with their adjuncts to the printing office are ingenious, as are the calculations and theories suggested. They do not as yet, however, fulfil all the conditions required in practice, and hand labour in this department of industrial art may be said to hold its own.

"Sewing machines of divers forms, and with little peculiarities, which go to make up a considerable amount of difference, are to be found in the Western Annex. These remarkable domestic appliances have been so minutely described in the *MECHANICS' MAGAZINE*, in time past, that we need not dwell upon them now. There is no doubt that they are working out a social revolution not only in this country, but throughout the civilised world, and it would have been unpardonable to have omitted altogether noticing the specimens exhibited at Kensington. Messrs. Newton Wilson & Co. are the largest exhibitors, and among the ponderous and massive mechanical appliances by which the sewing machines are surrounded, perhaps there are none which are morally speaking, more powerful.*

The Eastern Annexe.

"Perhaps the Eastern Annexe is, as a whole, one of the most satisfactory departments of the Exhibition—industrially speaking. It is well arranged, and taken alone forms an excellent exemplification of the progress and present condition of agricultural and horticultural science in England. The steam-engine, which had already effected so much for the material comfort and moral welfare of the people of this favoured land, by impelling machinery, and in the varied processes of manufacture, and in transporting people and merchandise from place to place—the mighty and yet delicate steam-engine is shown in the Eastern Annexe to have become also the chief cultivator of the soil. To its irresistible power the stubborn globe is now made to yield its richest treasures, and the golden harvests bow in due season to its "its sturdy stroke." The application of steam to the tilling of the ground is, indeed, one of the proudest achievements of modern time. The eleven years which have elapsed since the existence of the glorious palace of iron and glass in Hyde Park, have developed rapidly the arts of husbandry, but

* An unfortunate error, in respect to the dimensions of the cylinder of the Achilles, as exhibited by Messrs. John Penn & Sons, crept into our last week's notice: the real diameter of that noble casting is 112 inches.