

it can be set on mudsills framed in the ground, on one side, or if desired, elevated three or four feet. Another piece of machinery which attracted a large share of attention was a 40-horse power Economical Engine, driving all the machinery upon the ground. It is simple but elegant in design, easily regulated, runs smoothly, and is a fine model of mechanical ingenuity. Among other great advantages are the additions of "outer bearings" to the valve spindles. The "stuffing-boxes" are supplied with brass "glands," and are firmly secured in place by a screwed "cap," thus avoiding any liability to get out of line. All the piston-rods and crank-pins are of steel. The valve-spindles are made of the best Lowmoor iron. Engines of this kind are complete in every particular and are fine models of engineering skill. In connection with this engine we saw a movable "coal-heater," or "boiler-feeder," which, as its name implies, supplies the boiler with water. One would scarcely suppose that so small an article could perform the large amount of work which it does daily. Its height is only two feet, by eight inches in diameter. It will furnish a fifty horse-power boiler with all the water that is necessary. The water leaves the heater at about 212°. The fuel saved by the use of this simple article must be considerable. Another point in favour of this engine is that it has a removable water-chamber, a benefit which those who employ steam largely will readily appreciate.

Next to the above was a 4 horse-power Up-right Boiler and Engine, especially adapted for the use of those requiring light power. It is largely used in printing-houses and cheese factories. In this invention care has been taken to guard against fire, and the fact that Insurance Companies do not make any extra charge is an indirect assurance of its safety. These boilers consume hard coal. As the engine and boiler are placed on one casting, they can easily be erected. An ingenious contrivance to guard against explosion is another valuable consideration; the engine is furnished with a fusible plug, which relieves the boiler before the crown sheet is exposed. This provision is so simple that a boy can understand its operation. A 5 horse-power engine occupies only 3 feet 6 inches \times 4 feet 4 inches high, and is made from templates, so that all duplicate parts interchange.

An assortment of Rotary Pumps, for protection against fire, was exhibited by the same firm on the south-west side of the Crystal Palace. These pumps have been in use several years, and have stood most severe tests. The same firm exhibits a "climax saw-gummer," for which they are agents, as also an assortment of saws, among which Emerson's Patent Adjustable Extension Tooth Planer Saw, deserves commendation for its novelty and usefulness. Its novelty consists in a patent appliance for inserting larger sized "bits or teeth," which can be moved backwards or forwards by means of a tapering key, or, when requisite, taken out. The advantage is apparent, there being no strain upon the plate of the saw, besides securing greater ease in running.

The Welland Vale Company, St. Catharines, showed a splendid assortment of steel axes, chisels, scythes, draw-knives, adzes, hammers, hoes, rakes, &c.

The Whiting Manufacturing Company, Oshawa, also made a similar display of tools of elaborate finish and quality.

James Robertson & Co., Toronto, had on view a magnificent assortment of saws of all sizes and for

all purposes. The exhibition made by this firm was much admired.

R. H. Smith's, (St. Catharines,) display of saws occasioned universal expressions of approval for the taste with which they were arranged, as well as for the magnificent quality of the metal. Mr. Smith was one of the few Canadian competitors at the Paris Exposition, and succeeded in obtaining "honourable mention" from the judges. The largest circular saw ever made or imported into Canada—so we are informed—was on exhibition, being a circular of eighty-four inches. Saws of every make were on view, the entire display being warmly commended by competent judges.

The Union Iron Company of Buffalo (represented by Messrs. J. H. Bartlett & Co., of Toronto) exhibited a fine collection of iron work, consisting of rolled beams, channel, tee, and angle iron and shafting of all sections and sizes, from a 4 inch beam weighing 10 lbs. per foot, to a 15 inch, weighing 66½ lbs. per foot. The largest sample of angle iron, 6 \times 6, we were informed is a most unusual size to make, and only recently manufactured. Specimens of sections of the "Kellogg" columns, extensively used in bridge building, were on view. The columns are made exclusively of wrought iron, and their peculiar sections were particularly noticeable, receiving high marks of commendation from scientific men present. The iron was of excellent quality.

The celebrated Sheffield (England) firm of Turton, Bros. & Matthews were also represented by Messrs. Bartlett, and were awarded a first prize for their fine assortment of files, of all shapes and sizes. For fineness of cut and firmness of bite they cannot be excelled. The Union Car Springs Manufacturing Company of New York, through Messrs. Bartlett & Co., exhibited a sample lot of car-springs, ingenious but simple in construction, consisting of spiral coils of steel, placed inside of each other, thus giving greater strength and elasticity of spring. The specimens on view were of the best possible make, and from their simplicity and strength will doubtless be widely used by railway companies. A steam pump, called a "Pulsometer" or Magic Pump, made by Messrs. C. H. Hall & Co., of New York, was shown by Messrs. Bartlett & Co. It is a simple casting with four valves. The steam pipe, ¾ diameter, and discharge pipe, 1½ inches were the principal tubes, and from the force which this small instrument exerts, its usefulness cannot be questioned. Various firms which Messrs. Bartlett & Co. represent were fortunate in exhibiting so varied and excellent assortments.

The Bowmanville Machine Company—The exhibit made by this Company of lathes, planing and morticing machinery was very fine. The first to which our attention was drawn was a wood and iron-framed tenon machine, the specialty being the width of tenon, 14 inches. A power morticing machine, particularly adapted to sash, door and blind work, was next inspected. Rapidity of motion was easily and promptly obtained, the machine executing its work thoroughly. It is provided with an adjusting wheel and rods. We were next shown an iron topped shaper, for shaping and rounding mouldings. A decided improvement is effected in this shaper over others formerly used; the belt is protected with iron flanges placed underneath the steel top, out of sight of the workman, and so arranged that they cannot possibly get loose by ordinary means. A band saw, shown by the same firm, with a cutting