

The portion I, Fig. 2, is a centering shoulder for the aperture J, in the female flange F, and projects far enough through the web of the wooden pulley to enter the latter. The parts being brought together, the nut is set up on the holder, as already described, by means of the wrench K. This instrument, it will be seen, is adjustable through the whole range of ordinary line shafting. The final operation of setting up, with the wooden pulley in position, is represented in Fig. 4. The web of the pulley consists of any number of segmental pieces, in each of which the grain of the wood is in a radial line from center to circumference. In smaller pulleys the flanges have only two pins, but in larger ones four of the latter, as shown in Fig. 3, are employed.

PULPIT, ST. MARY'S CHURCH, SEYMOUR-STREET, EUSTON-SQUARE.

(See page 224.)

This pulpit is executed in Caen stone, with polished Devonshire marble shafts at the angles, and the shaft of the lower portion is of polished Cumberland alabaster. The niches are filled in with figures executed in Derbyshire alabaster; the centre contains Our Lord Jesus Christ as the Good Shepherd, and on either side the four Evangelists. The stairs are of oak, with metal-work.—*The Builder.*

BORING CURVED NOZZLES.

(See page 205.)

To bore curved nozzles with boring tools having perfectly straight outlines, and with a simple revolving motion and rectilinear feed, may perhaps appear at first thought to be an impossibility; but that it is a perfectly practicable matter has been shown by Mr. Edward Reynold, of Messrs. Vickers, Sons & Co., Sheffield, an engineer well-known for his aptitude in scheming neat mechanical devices. Mr. Reynolds' attention was first directed to this matter by his desiring to accurately bore some mouth-pieces for trumpets, and to do this he devised the very simple tool which we illustrate in the annexed diagrams.

THE *New York World* says:—"A new locomotive, recently completed in Philadelphia, under the direction of Mr. Weston, of Manchester, England, is about to pass over the Pennsylvania Railroad on a trial trip. It is claimed to possess greater power and to be run at less expense than any other engine, as it utilises both smoke and steam, and it will draw a heavily loaded train of 100 cars and can be stopped within its own length. The cab is on top of the boiler, and the smoke-stack is the size of a common stove pipe. Much interest is excited in the new invention."

The following notes on Japanese iron are from *Le Constructeur*:—"The blast-furnaces of Japan are small, and of very simple construction, although built on the same principle as those of Europe. The walls are built of fire-proof clay, mixed with a few stones. The blast furnaces are round, and have an opening at the side, closed by a band of clay; opposite are two other openings, through which comes a strong current of air, driven into the furnace by Chinese bellows worked by men. Before pouring the ore into the furnace they mix it with coal, and subject it to a previous calcination, so as to get rid of its carbonic acid and sulphur. The Japanese do not understand puddling as practised in the West; but the principle of their procedure is exactly the same. The fused iron, mixed with a little sand and pieces of iron, is again fused with charcoal in a second furnace, where it is left to cool for several days, until the whole mass has the appearance of fluid. The Japanese method of making steel is quite different from that practised in Europe. They mix a certain quantity of iron in pigs and iron in bars, cover the mixture with borax, and melt the whole for a week in a small fire-proof crucible. The borax serves to dissolve the impurities in the dross. When the metal is separated from the dross, which floats on the surface, and cooled, it is hammered hard, and alternately plunged into water or oil, after which it is cemented and tempered. The mode of cementing is as follows:—The steel, on coming from beneath the hammer, is covered with a mixture of clay, cinders, marl, and charcoal powder. When this plaster is dry, the whole is subjected to a red heat, and the steel is afterwards cooled very slowly in warm water, which is allowed to become tepid. Steel thus obtained is not very supple, but extremely hard, because it is not properly tempered or completely freed from its impurities. It would not do for making watch-springs, but is used by the Japanese for swords and sabres, which are tempered as many as eleven times, and knives, which are tempered four times.

THE MINING AND SCIENTIFIC PRESS.

This excellent illustrated journal of mining, popular science and general news, published by Dewey & Co., patent solicitors, California, is a work of very great merit, and reflects credit on its publishers. There is scarcely any journal published in which we find so many well selected articles of general interest and instruction, and we thankfully acknowledge our indebtedness to this paper for many extracts therefrom of great interest to Canadian mechanics.

A NEW WAY TO DRAW CURVES.

(See page 221.)

The little instrument here represented may be of great aid to all such draughtsmen as have to draw various kinds of curves; it consists simply of a wheel which may be attached to the point of a compass, but instead of being fixed in a position at right angles to the radius with which a circle may be drawn, it is adapted for being set at various angles. When the compass is sufficiently loose in the joint, and pressure is brought to bear on the wheel, it will run forward at the angle it is set to, and cause the compass to open or close more, thus continually changing the length of the radius of the circle at a constant rate, depending on the angle at which the wheel is set; when set at 90°, it will move like a common compass, and describe a circle with a constant radius; as soon, however, as the wheel is set at an inclination, determined by a common protractor, the radius will vary constantly, and the result may be a spiral, if we continue revolving around the same center; or by shifting the center, we may obtain figures resembling ellipses, paraboles, cycloids, conchoids, &c.; why we say "resembling," any geometrician will at once see, as with this apparatus the curve depends on the magnitude of an angular function, which is not the case with the other curves referred to, but for all practical purposes the curves thus drawn are just as good as the others, and as graceful in form as can be desired.

In our figure the attachment to the compass is represented at the right side in full size; at the left, attached to the compass, and used to draw a spiral by hand. These pens are made by the Hartford Curve Scribe & Co., and can be obtained at their office at 294 Broadway, New York.—*Manufacturer and Builder.*

A GOOD WHITEWASH.—For whitewashing, a compound of glue dissolved in hot water and diluted with 4 gallons of water, to which is added 6 pounds of whiting, will be found to answer a better purpose than common lime. Wood-work can be washed with this glue size, and one coat of paint on it would last for years. A little chrome yellow would give a light, lemon-colored tint to the wash. A cheap paint for the floor can be made, which a strong, smart woman could apply to any floor, 5 pounds of French ochre, $\frac{1}{4}$ of a pound of glue, and a gallon of hot water. Dissolve the glue in a small quantity of hot water; when wholly melted add the rest of it, stirring it slowly until well mixed. Then stir in the ochre, and apply while hot, with a good-sized paint brush. When well dried apply one or two coats of boiling linseed oil. This paint dries very quickly, hardening in 15 to 24 hours.

AN immense excitement has lately broken out in Sacramento and elsewhere, over the report that tellurium in large quantities had been discovered on Rock Creek. Until this discovery was made, probably few of our readers ever heard of that strange mineral, of a silvery whitish colour, so scarce and highly prized as hardly to admit of any commercial value being placed upon it. This metal, it is said, is used by manufacturers in the United States of fine cutlery to give the keenest edge to engravers' tools, surgical instruments, razors, &c., it being supposed that the famous Damascus swords were edged with it; and as an instance of its great value, we are told that a manufacturing firm in San Francisco bought a single pound for which \$600 was paid. A small mine in Siberia, one in Hungary, and another in Utah, are, we believe, the only sources from which this metal is at present obtained. The discovery on Rock Creek was made in a tunnel of the Bear River Mining Company, opened in their search for iron, and the mineral is supposed to be contained in the ore at the rate of six pounds or more to the ton—enough to make the mine of fabulous richness, should there be no mistake in the matter. Numerous claims have been staked off, notices posted, and stock is already selling at a lively rate. At least so says a California contemporary.