as soon as it appears of the proper colour, it may be immediately removed from the heat. This is an operation of great nicety, and is generally performed by the master himself. The wire, though it in good measure retains the springiness which it had acquired in the drawing, and does not prove near so soft as it might be made by a greater heat, is, nevertheless, found to be sufficiently so, for yielding with ease, to the flattening-mill.

The flattening-mill consists of two rolls, turned in a lathe to perfect roundness, exquisitely polished, placed with their axes parallel, one over the other; set by screws, till their circumferences come almost into contact, and both made to go round by one handle: the lowermost is about ten inches in diameter; the upper, commonly little more than two, though some make it considerably larger; and indeed it would be more convenient, if made as large, or nearly so, as the lower: their width or thickness is about an inch and a quarter. The wire, unwinding from a bobbin, and passing first between the leaves of an old book, pressed by a small weight, which keeps it somewhat tight; and then through a narrow slit, in an upright piece of wood, called a *ketch*, which gives notice of any knot or doubling; is directed, by means of a small conical hole, in a piece of iron, called a *guide*, to any particular part of the width of the rolls; that, if there should be any imperfection or inequality of the surface, the wire may be kept from those parts; and that, when one part is soiled, by the passage of a length of wire, the wire may be shifted, till the whole width of the rolls is soiled, so as to require being cleaned and polished anew, with the fine powder called putty, prepared by calcining a mixture of lead and tin: the workmen value the rolls, from the number of threads they will receive, that is, from the number of places, which the wire can thus be shifted to: good rolls will receive forty threads. The wire flattened between the rolls, is wound again, as it comes through, on a bobbin, which is turned by a wheel fixed on the axis of one of the rolls; and so proportioned that the motion of the bobbin just keeps pace with that of the rolls.

[*To be continued.*]

On the Italian Wire-drawing Plates; and on Welding Cast-iron to Wrought-iron, by H. W. REVELEY, Esq. Civil Engineer; with additional observations, by THOMAS GILL, Esq.

IN the preceding article, "On preparing and gilding silver wire," extracted from the late Dr. Lewis's celebrated "*Commercium Philosophico Technicum*," the author mentions, that the gilt copper rods are first drawn through holes made "in plates of *hardened steel*, with a piece of tough iron welded on their backs, to prevent the plates from breaking;" and are finished by drawing them through smaller holes, made "in plates of a different quality; those of *steel*, whether in a hard or soft state, being now found to fret the wire, or to raise a bur upon its surface, and strip off the gold. The plates for this

part of the work are brought from Lyons, in France; the holes are drilled in them here. They are formed of a *metallic mass*, whose composition is kept a secret, but whose prevailing ingredient is plainly *iron*."

We have recently been favoured by Mr. H. W. Reveley with an account of the method practised in Italy for making their plates, and which is as follows:

A piece of plate-iron is formed into a sort of shallow box or tray, its edges being bent or turned up at a right angle all round. This case is then filled with broken pieces of *cast-iron*, and heated to a welding-heat, when it is well hammered, and firmly united to the iron. The holes are then punched through it from the back, the face of it being thus formed in the *cast-iron*.

This information throws considerable light on the probable method of forming the Lyons' plates; and, indeed, we know, that during the late war, *considerable quantities of cast-iron draw-plates were made and sold in this country for Lyons' plates, and fully answered their purpose!*

Mr. Reveley informs us, that the Italian and the Lyons' wire-drawers are continually in the habit of associating together. They gave the singular name of *Acciajo Salvatico*, or *Wild Steel*, to this compound of cast and wrought-iron.

It is not the first time that we have known of this union of cast with wrought-iron, by welding. In the North of England, many years ago, it was no uncommon practice to *steel*, as they termed it, horse-shoes with pieces of cast-iron at their toes and heels, with bits of broken cast-iron plates, generally the backs of stoves or grates broken to pieces, and afterwards to harden them like steel; and they were found to wear as well, whilst the cost was much less, than if steel had been actually employed.

The working of this cast-iron and wrought-iron in Italy is always done in *charcoal fires*, which it is essential to notice.

[Tech. Rep.]

Improvement in Drawing Iron and Steel Wire.

ACCIDENT is frequently the source of improvement in the arts, and this valuable improvement owes its origin to this cause.

The acid liquor used in pickling iron-wire during the drawing of it, requiring to be warmed, ingots of brass, lying at hand, were accordingly heated red-hot and quenched in the liquor; the consequence of this was, that a portion of the copper in the brass became dissolved in the liquor, and was precipitated upon the surface of the iron-wire pickled in it.

It was found that *the wire thus coated passed through the holes in the plates with remarkable facility*, it requiring to be annealed much less frequently than before, owing, no doubt, to the copper prevent-