

overflow of the melted metal. Beslay electro-coats iron with tin preliminary to the final electro-coating. Holley coats iron with aluminium, in the fire, by means of a frit that contains felspar, silex, china clay, and a potash clay, when an external vitreous coating is required. When only a coating of aluminum is wanted, boracic trioxide is added to a potash clay; the slag throws itself off as the iron shrinks.

Owing to the trouble of arriving at the history of patented inventions prior to the year 1852, many important improvements have been repatented. This difficulty, however has been much lessened by the printing of the specifications, superintended by Mr. Woodcroft, in his successful endeavor to carry out the amended patent laws. Lately, and more especially since the year 1857, his attempts have received great accession of strength by the publication of "Abridgements of the Specifications," in series chronologically arranged, and drawn up by competent men acquainted with the subject to which each series refers.

Notwithstanding this, the number of inventions still repatented may be drawn from the following analysis of those relating to our subject between the years 1861—1865, inclusive:—

Resin was used on the surface of melted metal as early as A. D. 1786. Silvering glass with silver, which is afterwards electro-coated with copper, is referred to in the year 1852. Apparently, the first patent in which machinery was used for tinning iron or steel plates was secured in 1852. A solution of copper carbonate in potassium cyanide was used to electro-deposit copper in 1853. Although Smee sets forth the deposition of copper from its electro-solution in potassium cyanide, it forms the subject of Walcott's patent. Smee, in 1851, and Alexander Watt, in 1860, electro-deposit silver from a solution of its chloride in potassium cyanide. Smee points out the electro-deposition of gold from a solution of its chloride in potassium cyanide. The combination of hydric tartrate, ammonia, and potassium cyanide, was used in 1857 to electro-deposit silver.—*Ironmonger (London)*.

MANUFACTURING INDUSTRY OF GERMANY.

An article in the *Revue Contemporaine* on the manufactures and industry of the Zollverein affords some interesting information at a time when the future of Germany so largely fills the public mind. When, about thirty years ago, the Zollverein was formed, and entered on a manufacturing career, the views of the promoters of that great commercial league were confined to supplying the home demand. The export trade was dependent on arrangements with the Hanseatic ports. In Germany, as in France, the rural population largely exceeds in number any other. There are no cities equal to Manchester or Glasgow. Iserlohn, Solingen, and Remscheid, can no more compare with Birmingham and Sheffield than Aix-la-Chapelle can with Leeds, or Chemnitz with Bradford. Nevertheless, the progress of the manufactures of the Zollverein has been very rapid. The populations have doubled, tripled and even quadrupled in forty years. Thus, Breslau has increased from 78,000 to 164,000; Elberfeld and Barmen, from 43,000 to

122,000; Cologne, from 56,000 to 122,000; Nuremberg, from 27,000 to 70,000. In like manner the capital cities which share in benefits of commercial prosperity. The population of Berlin has increased from 200,000 to nearly 700,000, and that of Dresden from 55,000 to 146,000 in the same period.

It is in Westphalia, in the county of Berg, and in the environs of Aix-la-Chapelle, that metal manufactures have been most developed. Linen manufactures, although suffering from too long adherence to hand-work against machinery, has held its ground in Westphalia, Saxony, and Silesia, where likewise woollen manufactures have made, and continue to make, great progress, as well as in Brandenburg and the districts of Aix-la-Chapelle. The town of Chemnitz, in royal Saxony, has become the centre of an important manufacture of printed woollen fabrics, which is also carried on in Thuringia. Spinning and weaving cotton are largely carried on in Saxony, in the valley of the Wipper, at Elberfeld-Barmen, and on the banks of the Rhine at Cologne, Gladbach, and Rheydt. Silk manufactures flourish at Crefeld and at Viersen, as well as at Elberfeld-Barmen, where also the production of mixed fabrics of silk has attained considerable importance. Beet-root sugar, one of the most important of the modern manufactures of the Zollverein, is most vigorously carried on in Prussian Saxony and Silesia. Chemnitz is often called the Manchester of Saxony. Having at its doors the rich coal mines of Zucchau, it produces not only cotton fabrics, but linen, hemp, and woollens, spinning, weaving, dyeing, and has also great factories for the manufacture of the necessary machinery. The provinces which participate the least in this manufacturing progress are those on the shores of the Baltic and the North Sea, the only important manufacture being that of tobacco at Bremen. The least industrious of this vast region is Mecklenberg, where feudal laws still prevail, administered by an aristocracy of the narrowest and most bigoted character. South of the river Maine there is only one essentially manufacturing district, of which Nuremberg and Furth are the centres. Bavaria proper is the least manufacturing country of meridional Germany. The manufactures of Nuremberg are of a very varied character, and occupy two-thirds of the population. Augsburg has seventy establishments, employing eight thousand workmen. The manufacturing force of the south is, however, very inferior to that of the north. The production of articles of luxury is much less developed in the Zollverein than in France or in wealthy England, a country less successful than Germany in the cultivation of the fine arts, but where, for the last ten years, great attention has been paid to the application of art to manufactures. The superiority of France depends on the superiority of French taste, which is shown in design, colour, and form of everything produced for the wealthy and fashionable. Germany has nothing to rival the splendours of the best produce of Lyons or the magnificence of French shawls and carpets. France is also unrivalled in gloves, fine hats, Sèvres porcelain, bonnets, glass work, jewelry, and art bronzes. The only competition possible is in cheap imitations. The practice of art applied to manufacture is more actively centralized in Paris than in any city of the world, and Paris, the greatest