Scientific American.

NEW YORK, NOVEMBER, 1, 1856.

New Cast-Steel Process.

R. A. Brooman, of London (Editor *Mechanics' Magazine*) has secured a patent as agent for a foreign inventor for what is called "a new method of manufacturing cast-steel."

The basis of the invention consists in the introduction into crucibles, along with the pieces of wrought or malleable iron, of certain chemicals in which cyanogen is contained. As for example, cyanide of potassium and ferrocyanide of potassium, are to be used in connection with some form of sal-ammoniac. The usual furnaces and melting pots suitable for melting blister steel may be employed. The malleable iron (which may be of any description, such as bar, scrap, blooms, &c.,) is prepared by cutting or breaking it up into small pieces. In a 50-lbs. charge of iron in a crucible are introduced ten ounces of charcoal, six ounces of common table salt, half an ounce of brick dust or oxyd of manganese, one ounce of sal-ammoniac, and half an ounce of ferrocyanide of potassium. The pot is then to be covered and introduced into the furnace, and the contents thoroughly melted, the heat being maintained for the space of three hours or thereabouts. The mass is then to be poured off into iron molds in the ordinary way of pouring cast-steel, and with the usual care required for producing a solid ingot. This may then be rolled into sheets, or hammered and tilted into bars, after the common method. In this process the employment of table salt, manganese, or brick dust is for the formation of scoriæ upon the top of the melted mass, to keep out the air. The proportions of ingredients given may be varied, and some may be omitted altogether, or others substituted. The essentials are the sal-ammoniac, some substance affording cyanogen, and charcoal. Fine cast steel may be produced with ferrocyanide of potassium and charcoal, also with sal-ammoniac and charcoal. The hardness or brittleness as well as firmness of grain and degree of malleability may be varied by altering the proportions of the several ingredients, especially of the charcoal, sal-ammoniac, and cyanogen. No particular character or quality of iron is necessary. Steel, it is stated, can be produced by this process from common English iron equally as well as from the best Swedish.

There is only a mixture of common materials to convert iron into steel by this process, and yet there is considerable that is novel in the particular mode of applying them to produce the specific result. For example, the ferrocyanide of potassium (prussiate of potash) is now, and has been used for a long time to steel the surface of iron articles, by the process called *case-hardening*; but so far as we know, it has not before been employed in the crucibles to convert iron into steel. Then again, charcoal and manganese, and brick dust and salt, have been used, and are now employed mixed with scrap and broken iron in the crucible to convert it into steel; this is "Heath's process," and was a most valuable discovery when it was made. Cyanogen, which is stated to play *the* important office in this new process, is a compound of nitrogen and carbon; sal-ammoniac, which is also used, is a compound of nitrogen and hydrogen. We have no doubt but good steel can be manufactured by this new process, as the cyanogen materials employed have been proven by experience to produce the effect of *steeling* iron, even before cyanogen was known by name in chemistry, or its composition was discovered. That is, pieces of horn and scraps of leather were employed hundreds of years ago by blacksmiths, tool makers, and armorers, for case-hardening iron; and it was the cyanogen in these substances which produced the specific effect; but the cause was then unknown to those who operated with it.

The prussiate of potash is manufactured from hoofs, horns, and scraps of leather, and although it is now much employed as a substitute for these crude ingredients in case-hardening, there are many who still follow the old method, and continue to use scrap leather.

Illustrate your Inventions.

Last week we briefly alluded to the fact that nearly all the prominent novelties at the Crystal Palace, in the mechanical department, had been illustrated and described in our journal.

The same circumstance is observable at almost every public exhibition, whether of a mechanical or agricultural nature, wherever held.

The most successful and profitable patents, beyond all doubt, are those that have been illustrated in our paper. In reminding patentees of this fact, we would also inform them that we make no charge for publishing engravings of new inventions, so that if they fail to avail themselves of the privilege which others enjoy, it is their own fault. All we require is, that parties shall pay the cost of the cuts.

The SCIENTIFIC AMERICAN is probably read by 75,000 or 100,000 persons every week. It is the leading guide and authority in respect to inventions. Indeed, it is a sort of public record of them. Every inventor should put his discovery on record, even if it is only for his own satisfaction.

Sales of Patents.

Bishop's Sad Iron.—Patented May, 1856. G. W. Bishop, Brooklyn, N. Y., has sold one half of his Sad Iron patent, illustrated in the SCIENTIFIC AMERICAN, Vol. 12, No. 1, for the sum of thirty thousand dollars ($30,000.)

Vice's Windmill.—Patented Aug. 29, 1854. T. C Vice, of Rochester, N. Y., and W. D. Snow, of Chicago, Ill., half assignee, have sold the patent of the above windmill for the State of Indiana to James C. Rose, for the sum of $7,000. Also the State of Missouri to A. C. Pardee, for $10,000. We are informed that there are nearly fourteen grist mills driven by this windmill, now in course of erection in different parts of Illinois.

Spear's Weather Strip.—Patented April 22d, 1856. Mr. Alfred Spear, of Passaic, N. J., has sold the above patent for the State of Ohio for $3,500, and the State of Illinois for $2,500. All the doors and windows of the new Court House at Cincinnati, O., are furnished with the above invention. See engraving Vol. 11, page 96, SCIENTIFIC AMERICAN.

Stephens' Corn Sheller.—Patented April 22d, 1856. Richardson & Co., Chicago, Ill., report the sale of the above patent for Illinois, Iowa, and Missouri, for $3,000.

Griffiths & Shield's Horse Shoe Machine.—Patented Dec. 19th, 1854. Mr. Robert Griffiths, Philadelphia, Pa., informs us that he has sold the above patent to a joint-stock company in that city composed of practical wealthy, and energetic men, for the sum of sixty-five thousand dollars ($65,000).

Steers' Tanning Process and Apparatus.—Patented March 4, 1856.—Ellithorp & Co., of this city, report the sale of one-half of Abraham Steers' patent, as above, for a handsome sum.

In addition to the above we have names and reports of many other patent sales, but they do not come to us sufficiently authenticated to warrant their publication.

These reports are intended for the information of the public and for the encouragement of inventors. We want our men of genius and means, to understand that their minds and their money cannot be better employed, than in originating and developing new inventions.

All persons who make sales of patents, or who hear of such sales, are requested to report the facts to us with a view to publication. Give names and dates, so far as possible.

We have reports of some large sales of American inventions in Europe, but shall defer publishing them for the present, for certain reasons.

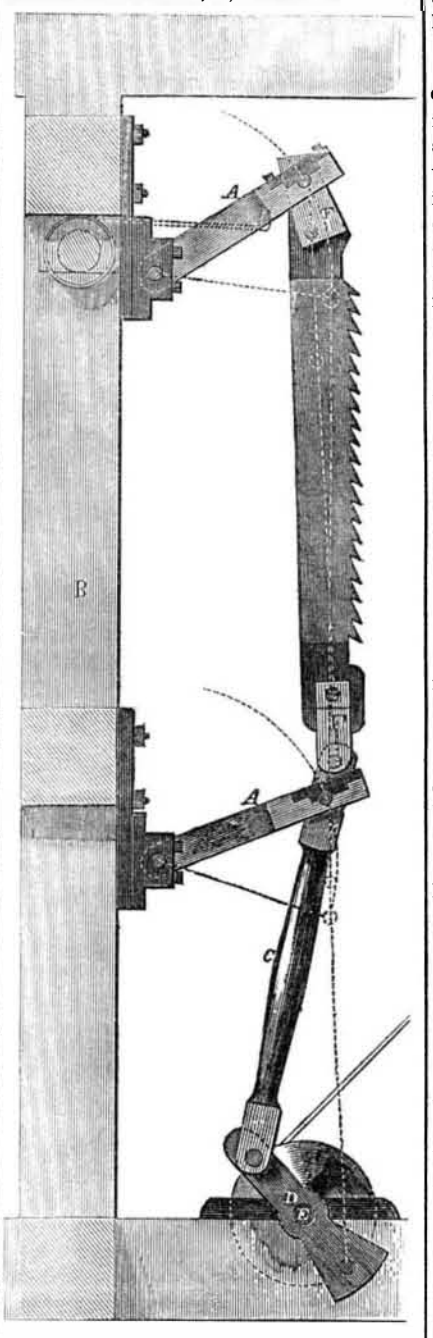
Resmelting.—Cast Iron Turnings.

It has been stated in some of our daily papers that iron turnings have been heretofore valueless, because of the impossibility to remelt them, but that Abiel Pevey, of Lowell, Mass., has invented a new method, and E. Lyon, of this city, another, to resmelt them, and thus render them useful. The method of the former is to place iron filings in hollow castings, and then resmelt them altogether; the plan of the latter—Mr. Lyons—is to make them into a compact mass, and smelt them in an open furnace surrounded with glowing fuel.

Such stuff is being continually set before the public by those who know nothing about the art of iron smelting. Why, excellent steel has been manufactured for a considerable period in this city from scrap iron, turnings, filings, &c. There is no difficulty experienced in smelting iron turnings and filings in a crucible.

New Method of Hanging Saws.

By John Robingson, of New Brighton, Beaver Co., Pa. In this improvement the saw is strained between the arms, A A, pivoted at their back ends to the frame B. The upper ends of the saw are furnished with jointed pendants, F F. Reciprocating motion is given to the saw by means of pitman, C, which connects with a crank, D, on shaft E.



As the shaft, E, is rotated, the two frames will have a vibratory motion, and the saw, in consequence of being connected to the frames as shown, viz., by means of the pendants, F, will have a rocking motion, the lower teeth of the saw cutting the log and then receding, the upper teeth acting successively in the same way, the last tooth that enters the log cutting last. By this arrangement the several teeth of the saw, as they perform their work, recede, and the saw dust is allowed to pass freely out of the kerf; the saw also requires but a small stroke, and will, it is said, cut a log 4 feet in diameter, with an eight inch crank equally as well as a log only half that diameter. The saw also may be operated with comparatively a small expenditure of power, and cuts rapidly. There is not much friction in the working of the saw, and but little lubricating material is requisite. The saw, in consequence of its short stroke, does not require to be long. In case of getting out of a vertical position, the saw may be readily plumbed, by having the bearings of the frames, A, and pendants, F, made adjustable. Patented May 20, 1856. Address the inventor, as above, for further information.

Great Exhibition of the American Institute at the Crystal Palace, New York.

SIXTH WEEK.

The interest manifested by the public to witness the Exhibition, has increased with each succeeding week since it was opened. During the past week, the visitors in the afternoons and evenings have been greater than on any former occasion. Some good machines and articles are entered every year too late to compete for prizes, but not too late to be seen and examined by thousands. This has been the case last week; we shall refer to some of these in our next number, in which shall also be published a list of the Prizes.

The Fair has been continued open for a week longer than was previously intended, to the great satisfaction of the public and exhibitors.

Portable Saw Mill.

R. Frazee, 114 West 15th street, New York, exhibits one of his patented portable saw mills, which appears to be exceedingly cheap and simple in its construction. Its whole weight, we are informed, is only one tun, and it is said to be capable of sawing any length or size of log. An upright saw is used. It can be readily put together or taken apart. Price $450 and upwards. Emerson & Co., manufacturers, No. 1 Spruce street, New York City.

Woolen Shawls.

The Bay State Mills, Lawrence, Mass., and the Watervliet Mills, Troy, N. Y., exhibit a number of checked woolen ladies' shawls and gentlemen's plaids. Their quality is equal to any of those imported, and their colors as brilliant. One scarlet shawl, by the Bay State Mills, embroidered with silk, is as well executed as any embroidery we have seen on foreign crape shawls. There is one great defect which we have often witnessed in the arrangement of colors, both in our shawls and carpets, to which we wish to direct attention, namely, a want of care in blending the colors according to the law of intensity, as well as the law of contrast. Thus there are various shades of the same color; these embrace quantity and intensity, and should always be blended with other colors, according to their degree of tone. We have seen a feeble green contrasted with a deep red, whereas it should have been a deep or intense green.

Trial of Hand Fire Engines.

A trial of various hand fire engines took place at the Crystal Palace on the 23rd ult. They played horizontally through 600 feet of hose. Engine No. 3, of Brooklyn, L. I., threw a stream 167 feet in length—the furthest thrown. It was built by Wm. Jeffers, of Pawtucket, R. I., and has proved itself to be a superior machine. The stream thrown was from an inch and an eighth nozzle. It is a short stroke engine on low wheels, and is of the kind called *piano*. It is our opinion that this form of fire engine is the best for hand work, as the men can exert their power much better with a short than a long stroke. Thus a stroke of the arms, reaching from the chin to a few inches above the knee, is one during which a man can exert the greatest force throughout its range. That part of a long stroke taken above the hight of a man's chin, tends to strain the muscles. Every engine should be built with such a stroke as can be best executed by those who work it, and as the strength of a man can be best exerted on a short low stroke machine, of course it must be the best. It is true that the length of the lever is less, but by making the arms longer, and putting on more men, they can be worked as easily as a long stroke engine.

Sewing Silk.

H. M. Hemingway & Sons, of Watertown, Conn., exhibit two cases of sewing silk manufactured at their mills. All the samples do credit to the manufacturers. The uniformity of the twist. and the closeness of *lay* in the strands, afford evidence that good doubling and twisting machinery are employed in its manufacture. The colors and luster are equal to any silk thread we have examined.

Capstans.

J. R. Pratt, 62 Attorney st., N. Y, exhibits a number of Capstans, of different sizes,