Machinery and Tools as they are.—Rolling Presses.

The pressure that can be obtained by passing an object between rotary rollers is probably more intense than that cquired by any other means, and the abov-mentioned description of machinery has been used for a considerable period in the manufacture of sheets of malleable iron, stel, and copper, when in the red-hot state, bu most others of the metals and alloys are roled whilst cold. This economical application of power often nearly supersedes the use of the hammer, as it performs its function in a more unitorm and gradual manner, and at the same time increases to the utmost the hardness, tenacity, elasticity, and ductility of such o the metals and alloys as are submitted to this and similar courses of preparation for the arts generally.

It is in the manufacture of malleable iron, preparatory to its being consigned to the hands of the smith, that the serviceable character of the rolling press is most conspicuously displayed. By the usual system the use of the rolls is subsequentto the prior process of "shingling" or working the balls of metal under a massive forge hammer, although it has been proposed to dispense entirely with the hammer substituting for it roughened rolls. A still later expedient for this purpose is the employment of three inverted cones, having such a relative position to each other that a space like a hopper is left between them. A mass of iron being thrown into this receptacle is gradually drawn down by the revolving cones, and well compressed during its transition, the fibres being also twisted in the same manner as yarns in a strand of rope. The rollers intended for iron works are turned in a variety of forms according to the section of the metal that is to be produced. One pair will have a series of angular groves for square bars, while others correspond to the shape of angle and railway iron. Others again are composed of a series of steel discs, placed upon a spindle to slit thin plates into a number of small rods for the manufacture of nails. The cylindrical rollers used in paper-making machinery for pressing the single sheet of paper as it is produced by the machine require that the two surfaces should fit each other with great accuracy, in order that the rollers may act uniformly upon the paper, and the surfaces at the same time are required to be very smooth, that they may may impart a finished surface to the paper. These rollers are sometimes six feet long and of eighteen inches diameter, and they are finished by an exceedingly tedious operation, being made to abrade each other without any sand or emery being employed. The engraver has long been aware of the exceeding power exerted by this form of press, and finding himself compelled to produce the most intimate contact between the paper and the metal plate on which his skill has been expended, he finds the common printing press inadequate to transfer the fine lines of the original. But by placing the plate and paper upon a bed, and passing them through the rolling press the faintest lines are reproduced.

One of the most elegant applications of mechanical science to the fine arts is due to American genius. We allude to Mr. Perkin's admirable process of transfer engraving, which may be thus explained A soft steel plate is first engraved with the required subject in the most finished style of art, either by hand or mechanically, or the two combined, and the plate is then hardened. A decarbonized steel cylinder is next rolled over the hardened plate by powerful machinery until the engraved impression appears in relief, the hollow lines of the original becoming ridges upon the cylinder. The roller is re-converted to the condition of ordinary steel and hardened, after which it serves for returning the impression to any number of decarbonized plates, each of which becomes absolutely a counterpart of the original, and each plate, when hardened, will yield the enormous number of 150,000 impressions without any perceptible difference between the first and last. In the event of any accident occurring to the transfer roller, the original plate still exists, from which another or any required number of rollers can be made; and from the rollers any number of new plates, each capable of producing as many impressions as above cited. This invention is most valuable, as it allows an unlimited number of proofs to be obtained from a plate executed at a great expense, and bankers and manufacturers have not been slow in availing themselves of the protection that it affords against counterfeiting. It will perhaps, in this place, be scarcely deemed a digression to dwell for a moment upon the best mode of annealing and hardening the steel rollers and plates. Several of these are placed in a cast-iron box and surrounded on all sides by fine charcoal mixed with an equal quantity of chalk, which is driven in firmly, the box is then placed in a furnace and exposed equally to the heat. The cooling extends over a space of 48 hours at least, the surface of the rollers and plates is then removed, and the device is raised in the transfer press. The plates are generally used in the soft state, but, as well as the rollers, are often hardened by being placed in a wrought-iron box with a loose cover and false bottom; the steel is surrounded by carbon from leather driven in hard, the cover and under side being luted with moist clay. The box is heated quickly and then placed over a large tub of water, after which the bottom slide is quickly removed, and the steel rollers immersed in this manner. With precaution the most delicate lines escape injury. The apparatus employed for curving plates is also well worthy of attention, it has two cylindrical rollers which travel in opposite directions, with a third roller just opposite these two, and which is capable of vertical adjustment When, therefore, the metal is carried along by the former two rollers, it strikes against the core of the bending roller, and is curled up to enable it to pass, so that it assumes a circular sweep, whose radius is dependent on the position of the roller, and when this is placed out of level, the work is then thrown into a conical form. However this press may be constructed, the same principle prevails in all, namely, the application of three forces.

The manufacturer of tubes avails himself, likewise, of the rolling press, and here it must be observed that the great feature of modern times, in the manufacture of tubes, is the being able to dispense with all internal support, and to complete the tube by external pressure alone, which is preferably given by grooved rollers.

Daguerreotyping.

Niepce, the original discoverer of the art in conjunction with Daguerre, used exclusively the bitumen of Judea; this substance is changed by light, only with much slowness, yet irrespectively of the pictures taken in the camera, he succeeded in copying engravings by the sole action of the light, and in making others, from which a limited number of impressions could be taken. He operated at first on tin plates, for which he afterwards substituted thin sheets plated with silver; it was while endeavoring to strengthen the shades of his impressions on the plate that he used iodine. By this means he discovered the photogenic properties of the coating of iodide of silver, which are manifested by a deep change of color, an unexpected result for the iodide of silver precipitated, is perhaps the insoluble compound of silver that darkens best in the light.

To Take out Stains from the Hands—A correspondent gives the following directions for taking out stains on the hands of Daguerreotypists:—Blue spots are produced by the union on the skin of a salt of iron with the cyanide of potassium. In this manner, unintentionally, Prussian blue is formed; now Prussian blue is soluble in caustic alkalies, it can therefore be made to disappear by rubbing the dyed part with a weak solution of potash or caustic soda; ammonia likewise gets rid of it. Yellow spots are attributable to the formation of a sub-salt, or an oxide of iron. When recent they disappear more easily than when they have been allowed to remain for some time; in the first case oxalic acid is useful, or the salt of sorrel; in the second hydrochloric acid, diluted with two or three times its volume of water.

Black marks may be of two kinds: if they are owing to the union of a salt of iron with gallic acid, which forms common ink; they can be made to disappear with hydrochloric acid prepared as above. If they are owing to the action of a salt of silver on the gallic acid, by moistening them with hydrochloric acid, they can be classified in the list of ordinary stains of salts of silver. These latter always dye the skin black; in time this color changes to a violet, afterwards to a dark brown, to a light brown—and at last disappears. To get rid of these stains the employment of an alcoholic solution of iodine has been advised. This method often efficacious, has the fault of dyeing the skin a yellow fawn color, the more disagreeable because it continues for several days. The infallible remedy is the cyanide of potassium. By spreading it in a powder over the part to be taken out, and then gently moistening it with water and rubbing it over the same, it will always clear off the stain Cyanide of potassium is a strong poison, it is therefore proper to prevent any harm that might result from its introduction under the nails or in a scratch, to wash the hands afterwards with a little chlorine, or, preferably, Javelle water. The following is a resume of the directions to be employed:—

1st. Using hydrochloric acid, which destroys the yellow color, owing to the salts of iron, and which restores all the salts of silver to the state of chlorides.

2nd. Soda or any other caustic alkali which takes off the blue color attributable to Prussian blue, and neutralizes the little acid remaining on the skin after the former operation.

3rd. Cyanide of potassium, which takes away all the stains due to the salts of silver.

4th. Lastly, for sanitary precaution, chlorided or Javelle water.—[Lumiere.

Atmospheric Hammer.

A mechanic in Rochester has invented an atmospheric hammer, intended to displace the trip and tilt hammers. The principle applied to move the implement is not unlike that of the caloric engine. The "Rochester Advertiser" explains the operation as follows:—The hammer in question derives its force from an exhausted cylinder—the vacuum being made by the turning of a crank by which the piston is raised and all the air forced out, when the connection is broken and the piston falls with the greatest velocity and force.—The entire weight of the hammer, cylinder, piston, and all the model in question, is but little over four pounds; yet it is competent to give a blow equal to seventy pounds. By means of a valve and key at the bottom of the cylinder, just so much air may be let in as may be desired, so that a light blow or a heavy one is produced at will. An eight inch cylinder will produce a force equal to the falling of 500 pounds upon the anvil, and the repetition of the blows will be in proportion to the velocity with which the crank is turned.—Exchange.

[The man who wrote the above certainly knows little about atmospheric pressure or the caloric engine. It is said that the action is like the action of the caloric engine, and that it is operated by a *vacuum*. Now there is no vacuum chamber or cylinder about the caloric engine, and there is never a vacuum in it. The piston mentioned above never can fall with the *greatest velocity* and force. Its pressure never can be more than 15 lbs. on the square inch, and its velocity is measured by the well known law of falling bodies. The vacuum is formed, it state, by turning a crank; very well, some person or machine must turn this crank. To do so a steam engine is the best power, therefore, the steam hammer is better than the atmospheric one. A hammer, however, can be operated by a water wheel compressing or exhausting air by well known means, such, perhaps, is the mode by which the above hammer is intended to be operated.

Spots on the Sun and Magnetic Variations.

We find the following statement in the "National Intelligencer," from its London correspondent:—

Mr. Faraday, in a late lecture before the Royal Institution upon the Magnetic Forces, made the following important announcement:

"A German astronomer has for many years been watching the spots on the sun, and daily recording the result. From year to year the groups of spots vary. They are sometimes very numerous—sometimes they are few.—After awhile it became evident that the variation in number followed a descending scale through five years, and then on an ascending scale through five subsequent years—so that the periodicity of the variations became a visible fact.

While our German friend was busy with his group of sun-spots, an Englishman was busy with the variations of the magnetic needle. He, too, was a patient recorder of patient observation. On comparing his tabular results with those of the German astronomer, he found that the variations of the magnetic needle corresponded with the variations of the sun-spots—that the years when the groups were at their maximum, the variations of the needle were at their maximum, and so on through their series. This relation may be co-incident merely, or derivative; if the latter, then do we connect astral and terrestrial magnetism, and new researches of science are open to us."

Agassiz and Humboldt.

Dr. Gibbes, of Charleston, at a dinner of the Medical Society, recently given, concluded a speech with this anecdote:—

When Agassiz first came to this country, he was under the direction of Baron Humboldt, to whom he was largely indebted for aid in his pursuits, and though desirous of remaining here, he felt bound to return to Europe.—Having received the offer of the Lawrence Professorship at Cambridge, he declined it on this account; but, in writing to his patron, he mentioned this fact, and at the same time expressed a desire to remain longer in the United States. The reply of the noble man was:—

"Sir, you belong to no country—you belong to Science; that is your country. You are released from any obligation to us; if you find the field of science furnishes you a better opportunity for your labors in the United States, you must remain there."

The Moose.

Prof. Baird, of the Smithsonian Institute, recommends the domestication of this animal, as they combine the qualities of the horse and ox. He says, "harnessed to a sled, a pair of them in Canada are reported to have travelled two hundred miles in one day," which may be regarded as a long story. A Swedish writer recommends their employment in time of war, for the cavalry and light artillery, from which he predicts great advantages would be derived in battle. At one time their domestication was forbidden in Sweden on account of their having been employed, from their extraordinary speed, to effect the escape of criminals. Recently, a law was passed to prevent their destruction for ten years.

Caloric Steamship.

The "Scientific American" comments with much good sense and consistency upon the unthinking enthusiasm with which certain papers give an account of the experiments made at the present time, in one of the New York docks, with a hot air engine, which has been placed in a splendid vessel. Not that Messrs. Munn & Co. have any ill-will towards Mr. Ericsson's invention; quite the reverse, but they are right in displaying caution, and in advising a similar course to their less competent co-editors in such matters. If, as it is to be hoped the Caloric Steamship succeeds in the experiments that are being made, the new motor will make its own character for itself without the assistance of others. Of all things, keep us from imprudent friends."

[The above extract is translated from the "Invention," an excellent and ably conducted monthly periodical, published at Paris by M. Gardissal, and devoted to industrial, mechanical, and scientific objects in general. The same journal likewise notices our remarks on the injustice of the law, by which the foreign inventor is mulcted in the sum of $100, when his claim has been refused,—as well as on the necessity of lowering the fees to English subjects, now that England has given the initiative.