Improvement in Printers' Quoins.

This quoin, now generally used in France, is rapidly gaining favor in this country. It is really a great improvement, and we are now using it in our office with much satisfaction.

It has the advantages of durability, saving in wear and tear of chases, so often broken and sprung by the use of the old quoins, entire freedom from shrinkage, much greater rapidity in locking up forms, and greater security, as a form once locked may stand any length of time and remain as tight as when first locked.

The pressure is equalized on all parts of the chase, and thus without undue strain all the pieces in the form are securely held without the use of beveled furniture.

The pressure is obtained by means of screws, actuated by triple or quintuple worm gearing, as shown, the central worm being turned by a hand key. The pressure thus obtained is very great. Various sizes are made, adapted to all sorts of newspaper, book, and job work.

This device was patented in the United States August 10, 1869. For further particulars address, F. Dorrity, 240 East Thirty-second st., New York.

Benefits of Science.

The practical view of agriculture cannot be more clearly or profoundly conceived than it was by the North American chief, whose speech on the subject is reported by Crêvecœur. The chief, in recommending agriculture to his tribe, the Mississippian Indians, said: "Do you not see that the whites live on corn, but we on flesh? that the flesh requires more than thirty moons to grow, and is often scarce? that every one of the wonderful seeds which they scatter on the soil returns more than an hundred fold? that the flesh has four legs to run away, and we only two to catch it; that the seeds remain and grow where the white man sows them? that the winter, which for us is the season for laborious hunts, is to them a time of rest?

It is for those reasons that they have so many children, and live longer than we do. I say, then, to every one that hears me, before the trees above our huts shall have died of age; before the maples of the valley cease to yield us sugar, the race of the sowers of corn will have extirpated the race of flesh eaters, unless the hunters re- solve also to sow." In his difficult and laborious life of the chase, the Indian consumes in his limbs a large sum of force; but the effect produced is very trifling, and bears no proportion to the expense. Cultivation is the economy of force.

Science teaches us the simplest means of obtaining the greatest effect with the smallest expenditure of power, and, with given means, to produce a maximum of force. The unprofitable exertion of power, the waste of force in agriculture, in other branches of industry, in science, or in social economy, is characteristic of the want of true civilization.

Breaking of Car Axles.

W. Bridges Adams, in a paper published in the Journal of the Society of Arts, says that the cause of the breakage of railway axles is to be found in the fact that they are strained beyond their powers, not by the load, but by imperfect structure of the vehicle they are attached to—imperfect, possibly, originally, but commonly by violence in use. "The running is wringing the neck of the axle."

With a view to lessen lateral friction of the wheel flanges as much as possible, it has been customary to keep the axles as near as possible together. This, if the bodies be long, involves "hogging," and oscillation, with a bad distribution of the load. Other things being equal, the nearer the axles are to the wagon end, the steadier they will be; but then flange friction increases with the length of wheel base, and a remedy must be provided for this.

Supposing that a train of wagons were built perfectly true at the outset, for a straight line, the multitude of longitudinal shocks would soon set the wheels out of truth, and so the question arises, whether it be possible so to construct them, that diagonal shocks to the frame, giving a permanent set, shall not affect the true running of the wheels; and next, whether wagons may not be so constructed as to dispense with the loose coupling, which is a material source of breakage to couplings, and displacement of the wagon frames? We think it is. Desirable as it is to point out the causes of the defects, it is still more useful to point out the remedy.

Value of Patents on Small Articles.

A good illustration of the value of patents on small articles in universal demand, is found in Miles' patent double-pointed tacks, designed for putting down carpets, oilcloths, matting, etc., and for hanging curtains, etc. Two patents have been obtained upon this improvement, and although recently introduced, the manufacturers are doing a large business. The tacks are made on the principle of the staple. The edge of a carpet nailed by them may be stripped up without the least danger of tearing the fabric. They are easy to extract when driven, as they have no heads to break off. They are a decided improvement on the old style of carpet tacks, and may be found advertised in another column.

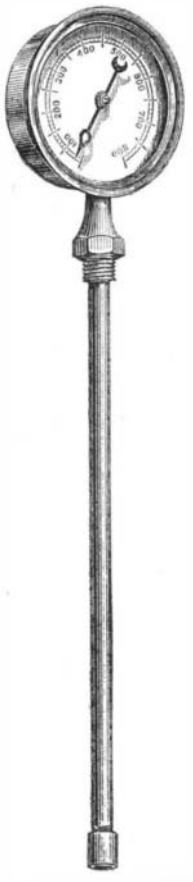
A NOBLE ACT.—Mr. A. T. Stewart, the well-known merchant of this city, is about to send 5,000 barrels of flour, on his own account, to relieve the suffering French. Mr. Stewart's example is a noble one, and will entitle him to rank as a benefactor to the suffering poor.

PYROMETER.

The pyrometer, or "heat measurer," is an instrument for indicating temperatures by the expansion of metals.

While, for many purposes, the mercurial thermometer is undoubtedly useful and indispensable, still, where such an instrument is subject to careless handling, or when, from the nature of things, the indications should be clearly read, and also when temperatures above 500 degrees are to be measured, it is evident that some other arrangement must be adopted.

Advantage being taken of the uniform expansion and contraction of metals, from heat and cold, an instrument is here shown, in which the longitudinal and differential expansion of two metal tubes is, by suitable mechanism, made to register, in degrees of any desired scale, on a dial similar to a steam gage. This pyrometer consists of a seamless drawn brass tube, inclosing a turned iron tube, and both are screwed into a socket at the bottom. The upper end of the iron tube is closed by a rod screwed into its bore, while the brass tube is secured to the case of the instrument. The iron tube being open throughout, and both tubes being in close contact, it follows that when they are immersed in the fluid, gas, or molten metal to be tested, the brass tube expands more than the iron, and carries it down with it, as they are united at their lower ends. This motion, which is uniform, is, by means of a toothed bell-crank sector within the case, and a small pinion on the pointer shaft, greatly multiplied, moving the pointer around the dial in any desired ratio to the motion of the inner tube.



This arrangement of the metals is claimed to insure their becoming uniformly heated, as it is highly important that both tubes should acquire the temperature of the substances tested as speedily as possible.

For showing the temperature of oil stills, gas retorts, steam digesters of all kinds, india-rubber vulcanizers, vats of hot liquids (as in dye works, breweries, etc.), as well as for superheated steam, this pyrometer will be found convenient, as it is not easily damaged (being all of metal) and its indications are as easily read as those of a steam gage.

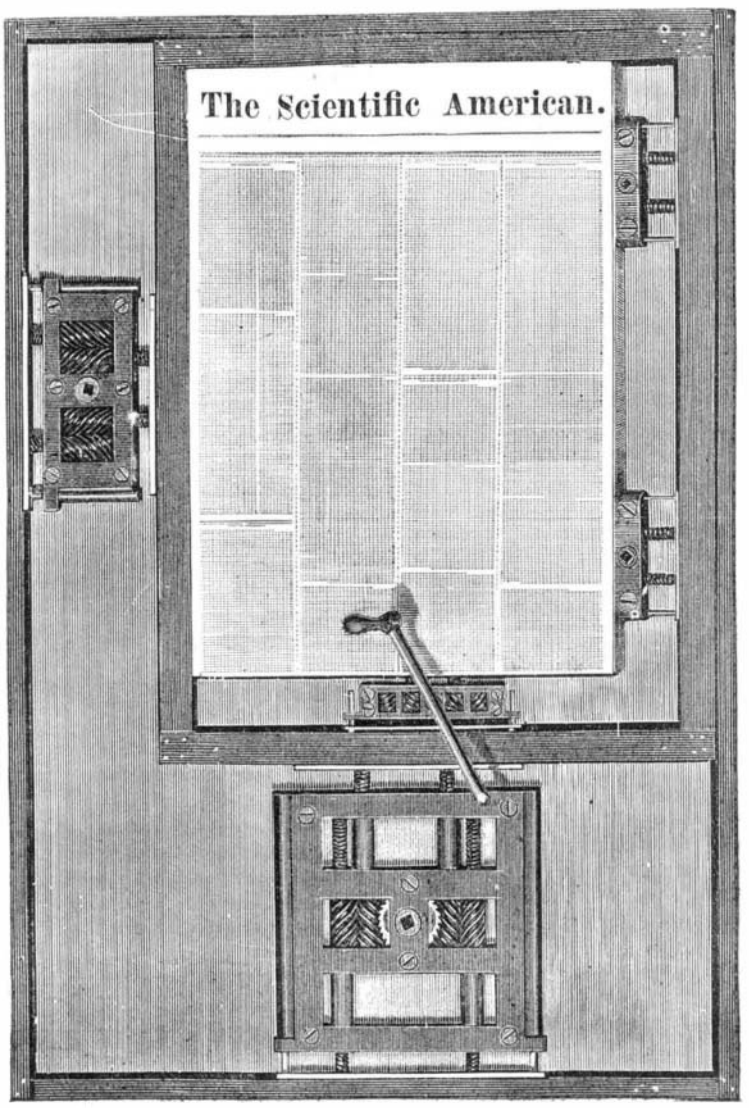
In cases where the tubes cannot be inserted, for want of room, they may be enclosed within a larger one, the end of which is screwed into the vessel containing the substance to be tested.

This pyrometer is used as a steam gage by attaching th tubes to the back, instead of to the bottom, of the case, and screwing the instrument into the head of the boiler, the dial being then vertical. The expansion of the tubes will thus always show the true pressure in the boiler, the dial being in that case graduated in pounds.

These pyrometers are graduated, after the tubes have been thoroughly annealed, by placing each instrument in a freezing mixture, then in boiling water, and lastly in high pressure of steam, from which points the length of the degree is determined.

They are manufactured in several styles, with tubes at the back or bottom of the case, and of any length between one and four feet, as may be desired.

Application has been made for a patent on this improvement, and the instruments are manufactured by the inventor, Henry W. Bulkley, mechanical engineer, 98 Liberty street, New York, who may be addressed for further information.



DORRITY'S PATENT QUOIN.

Exploding Charges by Electricity.

Franklin, in 1751, and Priestly, in 1761, suggested the possibility of applying the electric spark for the ignition of gunpowder charges; but electricity was not practically applied until about thirty years ago, by the French military engineers, since which its use has become general. It was employed to ignite the great blasts that destroyed the Round Cliff at Dover, and to remove the wreck of the Royal George, and has been largely used in heavy blasting with powder and nitro-glycerine in California, and for exploding torpedoes under water.

The variety of contrivances is very great. Many exploders have been devised to act either by heating a piece of thin wire, introduced in the circuit of a battery and placed in the charge, or by the passage of a spark produced by an electromagnetic machine, or Ritchie coil, through a sensitive explosive compound, thus causing a local explosion sufficient to ignite the whole charge.

Among those who have given great attention to this subject, Baron Von Ebner, of the Austrian military engineers, and Mr. Abel, of the British war department, who has devised one of the best exploders known, may be specially mentioned. A spark generated by revolving magnets is made to pass through a mixture of subphosphide and subsulphide of copper and chlorate of potash—materials of high conducting power and extremely sensitive to the spark. One of the great difficulties in the way of making such exploders is the liability of the materials to be merely thrown aside, and not exploded, by the passage of the spark.

In the United States, inventors have been active in devising different forms of apparatus for igniting explosives. They all depend upon either the direct passage of a spark or the heating up of an imperfect conductor, immersed in an explosive mixture. This mixture and the arrangement of wires are inclosed in a small cartridge of paper or wood, which can be readily placed in the midst of the powder, in the hole to be exploded. Mr. Stowell patented, in 1862, a peculiar form of cartridge, containing the ends of the conducting wires and a strip of platina. Beardslee, in 1863 patented a very simple mode of making an imperfect conductor between the ends of two wires, by drawing a pencil mark of graphite upon the surface of a piece of dry wood. Mowbray, in July, 1869, patented an improved electrical fuse for exploding charges of nitro-glycerin. It consists of a small cartridge of powder, in the top of which is placed a small quantity of a composition, like that used by Mr. Abel, made of sulphide of copper, 9 parts; subphosphide of copper, 2 parts; chlorate of potash, 3 parts; the whole intimately mixed. The ends of the wires are immersed in this mixture. It is designed especially to be inserted in cans of nitro-glycerin, to be exploded in oil wells.

The dealers in the new explosive compounds, such as nitro glycerin, dynamite, and dualin, furnish exploders especially designed for the several preparations. These various exploders may be fired either by the voltaic current, or by a spark from a suitable electrical machine, or the Page coil.—*Mining Machinery.*

THE AMERICAN BIRD TRADE.—The bird trade in America seems to be in a flourishing condition. Over 40,000 canaries are brought in every year, and probably 10,000 more are raised in this country for the purpose of sale. The number of bulfinches, goldfinches, thrushes, robins, and larks annually imported rise as high as 500 or 600 for each variety. There are fully 3,000 Java sparrows brought to the United States by vessels from that region, and fully as many parrots are yearly sold in this city alone. Waxbills and other minute varieties are scarce, and seldom arrive in quantities of more than 100 or 200 each year. Parroquets and love birds from Australia follow parrots in their relative importance. In native birds there is no reliable data to go upon. It is roughly estimated that about 10,000 mocking birds find their way from the wild nest to the cage each succeeding year.

RHEEA FIBER.—Notwithstanding the report that a number of machines for clearing rheea fiber had been sent in to the Indian Government in reply to the announcement published last year, none would seem to have been successful, from the fact of the time for competing for the prize of £5,000 having been extended for another year.