Untidiness and Ruin in Shops.

Whether it is that untidiness leads to ruin or that a manufacturer who is losing money has not the moral stamina to keep things in trim, thrifty shape is a hard matter to determine, but true it is that untidiness in the shop and office and ruin are such close friends that they are ordinarily seen together, and the sight of one suggests the other. We have often seen men of rare industry, judged by their hustling manner, who would spend much time each day looking for tools they had forgotten where they left, stumbling over piles of stray castings left under the lathe or piled on or under the bench, or pawing those castings over for a piece somewhere in this pile or that, when it ought to be in a place by itself, going from tool to tool or bench to bench to find or borrow a drill or wrench or hammer or block, when there should be just one place to find the desired article. And when the articles are found, he never thinks of returning them to their proper place. In fact, there will be no "proper place" for tools in such a shop, and the next man who wants them will go on the same hunting expedition about the shop. Such a shop will always have black and dirty walls and ceiling, with windows splattered with dirt and decorated with cobwebs, notwithstanding that the light is so bad that careful work is rendered impossible or tedious of accomplishment, when a few pence worth of lime and a brush would whiten the walls and ceiling, and greatly improve the light, and so expedite and improve the work. Money and time are lost and ruin invited by a neglect of these things.

But the greatest loss experienced by this deplorable and needless state of things is in the *morale* of the shop. Workmen compelled to work in a dingy, ill-kept, and ill-lighted shop will suffer loss of ingenuity, loss of ambition, loss of self-respect and respect for their employer and his interests. If they are forced to work at disadvantage the stimulus to activity and ingenuity suffers a gradual decay, and no one will pretend to deny that this decadence on the part of the workman is not a direct money loss to the proprietor.

Tidy workshops stimulate manliness and ingenuity on the part of workmen, and right here may be found the profit on the year's business, or if neglected the year's losses. There are plenty of establishments, east as well as west, which, by a careful attention to these matters—which they regard, in fact, as non-essential—could easily increase the efficiency of their workmen 10 per cent, and that per cent would determine the difference between a profit and a loss.—*The Pottery Gazette.*

An English Mummy.

A tomb has recently been opened in Canterbury Cathedral, for the purpose of discovering which of the archbishops it is whose body it contains. This is known to be one of three: Theobald, who died in 1139; Hubert Walter, who died in 1204; and Stephen Langton, who died about 1227. The investigation has not settled the point in dispute to the entire satisfaction of everybody; but the Society of Antiquaries in London have decided that the evidence is in favor of the body found in the tomb being that of Hubert Walter, who died in 1204, or nearly seven hundred years ago. The body found in the tomb, though it has been lying there nearly or quite seven hundred years, was in an extremely offensive condition; the smell arising from it was quite sickening, and unmistakably that of corrupt humanity. A number of articles of great antiquarian interest were found in the tomb and removed to the cathedral library. Most of them were in an excellent state of preservation. They were a silver chalice and paten as good as new, the archbishop's pastoral staff, a gold ring with large emerald having a curious device, silk boots ornamented with gold thread and garnets, a yellow silk miter, and embroidered stole.

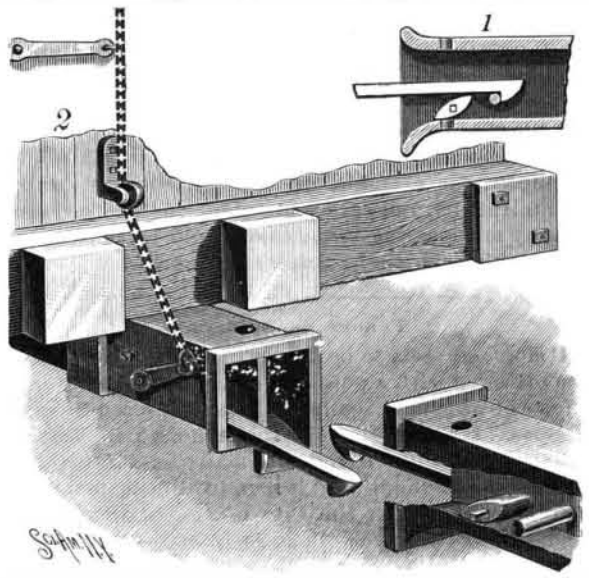
It appears to be easier to identify the remains of a distinguished personage of Egypt, who died four thousand years ago, than that of an English prelate dead for only seven hundred years. It might not be a bad idea to engrave upon the interior of the sarcophagus the name of the deceased.

British Patents in 1889.

According to the report of the Comptroller-General of the Patent Office for the past year, which has just been issued, the number of applications for patents in 1889 was 21,008, as against 19,103 in 1888; so that in the single year the number increased by nearly 10 per cent. The number of applications from the United Kingdom was as follows: England and Wales, 14,598; Scotland, 1,030; Ireland, 362; Channel Islands, 22; Isle of Man, 7—or a total of 16,019. The total number from British colonies and possessions was 343, of which Canada takes the largest number—100. For Europe there were 2,729 applications, of which Germany sent 1,336 and France 667; from Asia, 26; from Africa, 15; from America 1,875, of which the United States sent 1,857; and the Sandwich Islands, 1. The balance sheet shows that the receipts from fees amounted to £151,794; while the sale of publications brought £6,278. The total receipts (including the fees received for designs and trade marks) amounted to £172,820; the expenses to £79,286. The surplus for the year was £93,534.

AN IMPROVED CAR COUPLING.

The accompanying illustration represents a device designed to automatically couple cars, and with which they may be disconnected from the side or roof, while affording means of connecting cars by a link and pin attachment in case of accident to the improved device. The drawhead cavity is divided by a partition wall, and the hook bar is pivoted in the smaller compartment, on a transverse bolt which passes through both compartments. The lower wall of the drawhead at its front end has a downwardly and outwardly curved lip, producing a guiding incline for the entry of the hook bar of a similar coupling. In front of the bolt on



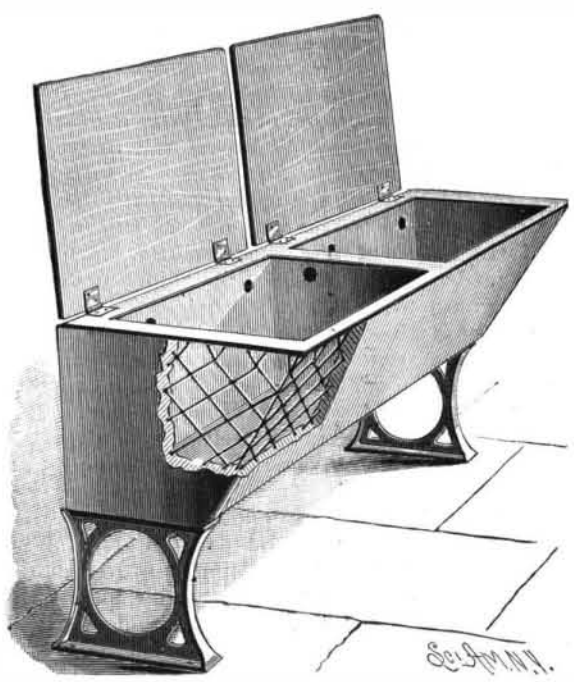
WILLIAMS & EDELSTON'S CAR COUPLING.

which the hook bar is pivoted, and nearer the bottom wall of the drawhead cavity, is journaled a rock bar, adapted to engage and vibrate the tripping blocks, as shown in the small view, one of these blocks being located in each of the compartments, whereby a limited oscillation of the rock bar will simultaneously elevate both of the tripping blocks sufficiently to release the hook bars of the engaged couplings. On the projecting end of the rock bar, at one side of the drawhead, is a rock arm having a chain connection with a depending pull bar supported near the roof of the car by sliding engagement with a bracket plate, there being also connected to this chain a horizontal lever pivoted on the end of the car, whereby the rock bar may be vibrated from either the top or the side of the car. The drawhead is vertically perforated near its front end to receive a coupling pin, thus providing means for the use of the ordinary link and pin coupling.

For further information relative to this invention address the patentees, Messrs. John J. A. Williams, No. 132 Fourth Street, and George J. Edelston, No. 617 Canal Street, New Orleans, La.

IMPROVED CEMENT SINKS, WASHTUBS, ETC.

The invention herewith illustrated, patented by Mr. John Moore, provides a novel manner of making washtubs, sinks, and other vessels of cement in combination with metal strips and woven wires, the wires being embedded in the cement to give strength and durability to the whole structure. The metal skeleton or frame consists of a continuous metal cap strip, which forms an outside protector to the rim or top of the vessel to keep the cement from being chipped. The cap strip is preferably made of a flat strip of pliable metal bent or doubled under on its opposite edges to give additional strength and present a good edge finish. The wire netting embedded within the cement is permanently soldered or fastened to the cap strip at the upper portions of the wires on opposite sides of the vessel, the wires being united below or at the bottom of the frame by doubling or twisting them around one another, or otherwise, the entire frame being thus compactly held together for the running of the cement about the wires.



MOORE'S CEMENT SINKS, WASHTUBS ETC.

For further particulars relating to this invention address the Union Granite Co., Guttenburg P. O., Union Township, Hudson County, N. J.

Furniture Beetles.

In the entomological part of the forty-first annual report of the trustees of the New York State Museum of Natural History, lately published, reference is made to the statements which have been advanced as to the long imprisonment of beetles within furniture. The writer suggests that when such cases occur the conditions may bring about a lethargic state, in which respiration and accompanying phenomena are almost or entirely suspended through the complete exclusion of air (a hermetic sealing) by the rubbing, oiling, varnishing, or other polishing which the furniture has undergone. As an instance of prolonged vitality, he quotes an extract from the third report on the insects of New York, by Dr. Fitch. In this passage Dr. Fitch says:

"In 1786, a son of General Israel Putnam, residing in Williamstown, Mass., had a table made from one of his apple trees. Many years afterward the gnawing of an insect was heard in one of the leaves of this table, which noise continued for a year or two, when a large long-horned beetle made its exit therefrom. Subsequently, the same noise was heard again, and another insect, and afterward a third, all of the same kind, issued from this table leaf—the first one coming out twenty, and the last one twenty-eight, years after the tree was cut down."

The evidence before Dr. Fitch convinced him that the insect was the longicorn beetle *Cerasphorus balteatus*, now known as *Chion cinctus* (Drury).—*Nature.*

An Old University.

The celebration of the six hundredth anniversary of the foundation of the University of Montpellier has been, according to *Nature*, most successful. All the great technical schools of Paris and the French provinces were represented, and deputations from many foreign universities were present. The proceedings began on May 22, when there was a great reception in the university hall. M. Chancel, the rector, welcomed the guests, and Professor Tedenat sketched the history of the university and its most celebrated professors. On the following day M. Carnot arrived. The delegates of foreign universities, followed by those of the great French schools, marched from the University to the Prefecture to be presented to the President of the republic, and if we may judge from a description by a correspondent of the *Times*, the procession must have been a remarkably interesting spectacle, the French and foreign professors being in robes of the most varied colors. The pavement and balconies along the route were crowded by men, women, and children. After the ceremony at the Prefecture the company proceeded to a park overlooking the town, commanding a view of the Cevennes on one side and the Mediterranean on the other. Several speeches were delivered under an awning. The rector of the university thanked the president for having honored the celebration by his presence. M. Croset gave a history of the university, and dwelt on the great trade of Montpellier in the middle ages, and its relations with the Arabs and Jews. Its most flourishing period, he said, was from the twelfth to the fourteenth century, and Petrarch spoke of it as a kind of ideal university. It made special progress in studies based on the observation of nature. The delegate of Bologna, the most ancient university represented, thanked M. Carnot for his reception of the foreign delegates. M. Bourgeois, Minister of Education, in a much applauded speech, said the government recognized the justice of the desire expressed by Montpellier and the other great schools to resume the name of university and the privileges associated therewith, and the question would shortly be discussed in the Chamber. We may specially note that the later proceedings included the presentation of an address by French men of science to Prof. Helmholtz, who represented the University of Berlin.

Automatic Photographing Machines.

A curious development of the "nickel (or penny) in the slot machine" has appeared in England. It is proposed to erect automatic photographing machines, corresponding in a general way to the other machines of this class for weighing, selling candy, etc., with which the public is now familiar. In the photographic machines a penny is placed in a slot, the person stands in front of a lens for about five seconds, being notified by the ringing of a bell when to cease posing. By the mechanism the plate is developed and fixed, and in forty-five seconds the photo is passed out to the purchaser. A second slot for halfpennies delivers a frame when one coin is dropped into it. It is claimed that the profit on each photograph is over one halfpenny. The chemicals used are a secret, and it is largely owing to their low cost that the figures given can be realized

The Principal Discoveries and Inventions of the Present Century.

The following is a chronological *resume* of the principal discoveries and inventions of our century:

Electricity especially has been put under contribution by the inventive genius of our investigators. At the moment that we were entering upon the nineteenth century, Volta had just invented the electric pile (1789). In 1820, Oersted, the Dane, discovered magnetic electricity, the laws of which were soon determined by Ampere, and, in the same year, Arago discovered the principle of electric telegraphy, which was afterward improved by Morse, in 1838, and by Breguet, in 1845, etc.

In 1843, Bunsen, a German, invented a new electric battery, and two years afterward Elkampton and Ruolz discovered electro-metallurgy.

Along about 1832, Faraday discovered electrical induction, upon the principles of which Rhumkorff, the German, established the coil that bears his name.

In 1854, Bourseul discovered the principle of the telephone, which was improved by Reiss in 1860, and afterward by Bell, and especially, since 1876, by Edison, who also, at about the same epoch, improved the phonograph, the first idea of which belongs to Leon Scott, a Parisian proofreader, who suggested it in 1856.

Between 1841 and 1878 are embraced the discovery of and improvements in electric lighting, and along about 1881 the French engineer Deprez conceived the idea of transmitting any sort of motive force to a distance by means of an electric wire.

While waiting, then, until the fairy electricity shall have dethroned steam, let us register what has been accomplished through the latter: The establishment of railways after the manufacture of powerful locomotives had been rendered possible (1832) by the invention of the tubular boiler by the French engineer Sequin (1828), and then the establishment of steamers, to which, as long ago as 1838, was applied the screw invented by Dallery, of Amiens, in 1803.

While we are on the subject of the methods of locomotion, let us say that aerostation likewise has made great progress, although the last word will not have been said in regard to this until the question of the steering of balloons, which has taken a long step in advance through the experiments of Messrs. Krebs and Renard, has been absolutely solved.

Cork jackets have been improved, and, at the present time, there is a great deal being said about submarine boats, like that of the inventor Goubet, whose wonderful experiments a short time ago astonished the spectators assembled at the roadstead of Cherbourg.

In an absolutely different line of ideas, let us mention the silk loom invented by Jacquard between 1790 and 1801; the Davy lamp, which dates back to 1815, and which has rendered mine accidents less frequent; the sewing machine, for which Thimmonier, of Amplepuis (Rhone), took out a patent in 1830, and which, since improved by the American inventors, Walter, Hunt, Howe, Singer, Seymour, etc., and by the Frenchmen Maquaire, Hurter, and Hantin, etc., and to some extent also by the mechanics of all countries, has come into so common use; and, finally, the rotary cylinder press, invented by Marinoni in 1867, and which prints 40,000 copies of a newspaper per hour.

In optics, Fresnel, along about 1820, improved lighthouses through the use of lenses that now bear his name, and in 1829 Niepce and Daguerre invented photography. We shall some day return to the history of this admirable discovery and the chronological series of improvements that have been introduced, but for the present let us recall that one of the last of these in date is instantaneous photography, that is to say, the possibility of obtaining an image in $\frac{1}{100}$ and in $\frac{1}{1000}$ of a second even, according to a report read by Mr. Marey to the Academy of Sciences in 1882.

In agriculture, Dombasle, in 1822, improved the plow, in recent years the English, and especially the Americans, have conceived the idea of applying steam to the operation of all agricultural machines—plows, seed planters, mowers, etc.; finally, Messrs. Remy and Gehin, taking up an idea that Jacobi, a German monk, conceived during the last century, developed the science of pisciculture, which Mr. Coste has succeeded in extending along our coasts.

A certain number of discoveries have been made in the line of chemistry: In 1811, Gay Lussac discovered iodine, in 1826 Balard discovered bromine, and in the following year Wohler obtained aluminum, which, later on, Sainte-Claire-Deville succeeded in manufacturing in a purer state and at a lower cost. Finally, we may mention Chevreul's and Berthelot's discoveries in organic chemistry, and those of Boussingault and Payen, who created organic chemistry, and then the labors of Claude Bernard in physiology and those of Pasteur on ferments, microbes, and viruses.

Thus, while certain savants endeavor, through science, if not to diminish the number of troubles that afflict poor mankind, at least to lessen the effects of them, other men seek methods of destroying people in the most rapid manner, when occasion occurs. Diplomats and politicians justify the researches of these men by constantly repeating that in time of peace it is necessary to prepare for war. Let us accept their dictum, and since, even in our century, savants and artisans can attend to their labors only under the protection of guns, let us record the improvements in modern artillery by the German Krupp and the Frenchmen Reffye and De Bange, and the improvements in the rifle by Dreyse, Mauser, Remington, and Lebel. Let us not forget the invention of smokeless powder nor the use of new explosive substances (such as gun-cotton, dynamite, panclastite, roburite, etc., each more terrible than the other) in the manufacture of frightfully destructive weapons, such as bombs, shells, and the torpedo of more recent invention.

All these discoveries have an importance which, it is true, varies in degree, but it seems to us very difficult to classify them according to importance; at all events, it is not we who shall endeavor to do it.

Our readers already suspect us of having a marked predilection for certain of these discoveries, and if, in such a classification, we should chance to place photography, for example, upon a par with telegraphy and telephony, railways and submarine boats, phonography and vaccine virus, they would perhaps accuse us of taking sides.—*La Science en Famille.*

Venomous Spiders.*

It does not seem to be generally known that spiders are provided with a poison of a very active nature, the effects of which are similar to those produced by snake poisons. It is true that the spiders found in England are small and quite harmless to man; but it is probable that some poisonous fluid is secreted in the mandibles of all spiders—even the bite of the common house spider (*Tegenaria domestica*) is quickly fatal to flies and other insects on which it preys. Spider poison appears to have special effects on certain insects, and the largest flies are not always the least affected by it. Insects over which spider poison has but little influence are usually left meshed in the web to struggle until exhausted before the spider attempts to devour them. When a fly is bitten by a spider, its whole body seems seized by violent convulsive twitchings, and death generally occurs after a few minutes. The spider's poison issues from a sac and duct at the base of its mandibles. It closely resembles the venomous matter secreted by scorpions, and is a transparent fluid, containing traces of formic acid and albumen. There seems to be nothing characteristic in its microscopic appearance. When it is collected from the poison glands of several spiders and dried, it will retain its physiological properties for many years, and even after it has been subjected to a boiling temperature its properties are not destroyed. The spider is provided with a most effective apparatus for injecting its poison, consisting of modified mandibles, called falces, the last joint of which has a hard curved fang, with a fissure near the point. The muscles used in closing the mandibles also press upon the poison gland, causing the poison to be expelled through the fissure into the wound, and thence into the circulation of the victim.

The reader should watch a common house spider spin its web. Its seems to take pains, before beginning, to select a spot where there are chances of obtaining plunder and where it will be secure. It then discharges a little drop of glutinous fluid, and creeps up the wall, joining the thread from one wall to the other. The first thread thus formed is drawn tight, and fixed at each end with other threads. It is upon this outer thread that the durability of the whole fabric depends. The web's foundation completed, the spider next makes a number of threads parallel to the first, and then crosses them with other threads, the sticky substance of which they are formed serving to bind them, when newly made, to each other. It now commences to double and treble the threads that border its web, securing the edges as it does so. Lastly, it forms a kind of tunnel with webbing; this is to serve as a retreat, where it can conceal itself from its enemies and also from its prey, and is generally placed in the angle of the walls. When the spider's work is done, it often happens that the approach of some large animal or the passage of the housemaid's broom will destroy in a minute the labor of days. In this case, as soon as the danger is passed away, the spider patiently begins to repair the web. For this purpose the spider is provided with a store of the glutinous matter of which the web is made. When possible, the spider prefers the mending business, as it is only provided with a limited quantity of glutinous matter, and when this is exhausted it probably cannot be renewed. Old spiders, which have neither web nor the materials to make one, often hunt about to find out the webs of other spiders, younger and weaker than themselves, with whom they venture battle. The invader generally succeeds, and the younger spider is driven out to make a new web, and the old spider remains in possession until a stronger spider invades the web and drives it out. When thus dispossessed, the spider seldoms ventures another attack, but tries to subsist upon the few insects that may fall accidentally into its clutches, and eventually dies of hunger.

*A. J. Field, in *Knowledge.*

The well-known tarantula is one of the largest, but by no means the most venomous, species of spiders found in Europe. It belongs to the mining section of the family termed *Lycosidæ* or wolf spiders, and attains a length of three-quarters of an inch. The tarantula's body is covered all over with down, chiefly of an olive dusky brown color. The upper border of the thorax and the outline of the eyes are yellow, and the back of the abdomen is marked with a row of triangular dark spots with whitish edges. Their eight eyes are arranged in three transverse rows, the front row containing four small eyes, while behind there are two pairs of larger eyes. During the summer months the tarantula, while creeping among the corn, bites people employed in the fields, but the bite, though painful, is seldom dangerous. Dr. Zangrilli, an Italian naturalist, who has had many opportunities of observing people bitten by this spider, says that soon after the occurrence the part bitten becomes deadened, and in a few hours there are slight convulsive shiverings, cramps of the muscles, spasm of the muscles of the throat, followed by vomiting and a three days' fever. Recovery generally follows after copious perspiration, but in one case there was tetanus and death on the fourth day.

The tarantula is common in Spain, Southern France, and Italy, occurring in great numbers in Apulia round the town of Taranto; it has been found in Asia, and also in Northern Africa. The tarantula is to be found in dry places, partly overgrown with grass, and fully exposed to the heat of the sun, living in an underground passage which it digs for itself, lining it with its web. These passages are round in section, and sometimes quite an inch in diameter, often extending to the depth of a foot or even more below the surface. This spider is very quick in its movements, and eager in the pursuit of its prey; it waits only to kill one victim before it darts upon another, and it has been known to allow itself to be carried into the air by a large fly that it has attacked, rather than relinquish its hold. The female tarantula lays from nine hundred to a thousand eggs in a season, and shows considerable maternal care. When the number of eggs she has brought forth have remained for an hour or two to dry after exclusion, she prepares to make a bag for them. For this purpose she spins a web and lines the inside with down which she plucks from her breast. Within the bag, which is almost as thick as paper, the eggs are deposited, and it is then fastened, by means of the glutinous fluid she secretes, to the end of her body. The female tarantula has never been known to abandon her offspring until they are able to take care of themselves. She hatches two broods in the year, in spring and autumn, and has been known to hatch three. The eggs are not adherent to each other in the cocoon. When the young ones are excluded from their shells within the cocoon, they remain in this confinement until the female, instinctively knowing their maturity, bites open the bag and sets them free. The young of web-making spiders after leaving the egg immediately commence weaving, but the young tarantula (leading a vagrant life, and having no web), being incapable of protecting themselves, remain for about a fortnight with the mother, giving rise formerly to a belief that they derived their nourishment from her body.

Railroad Building in Jamaica.

Since the first of the year things have changed considerably in and about Porus. Then work on the railroad had not been begun; now upward of a thousand negroes are at work, and in consequence yams, the staple article of food, have gone up in price. The first section of two and a half miles is approaching completion, and work is under way on the second section. A number of bridge and culvert abutments are up, built entirely of concrete. It would strike a person ignorant of the country as rather strange to see so many waterways staked out in places, not only where there are no streams, but where the work is actually delayed for lack of water to mix the concrete. The rainy season that is coming on will tell a different story. The mild manner of "driving" laborers, and the bland and unconscious manner of receiving the driving, afford a striking contrast to railroad methods in the United States; as does also the way in which material is handled. Carts are dispensed with. Men fill square boxes, which women, for the greater part, carry off on their heads and empty. The carrying of things on the head is here reduced to a science. Everything, from a sucking pig tied on a board to a can of water, is so carried. The negro who carries the transit instrument in the field at first, in the most matter-of-fact way, lifted it to his head. The water boy carries a 30 or 40 pound can of water thus over rocks, where others are often inclined to crawl. World's Fair preparations for 1891 are going on, notwithstanding the opinion of many that it will be premature. Efforts will be made to interest American exhibitors. American road wagons, to take the place of the clumsy mule drays used here, could be exhibited with advantage; as could machinery for preparing fiber for rope from plants with which the island abounds.—*N. Y. Tribune.*