passed through the upper portion of the ornamental work, and were secured by attachment to four plates of iron, which were built into the tomb itself, under the slab on which the effigies rested. These four iron plates, notwithstanding their protection, first by the work of the tomb itself, and, secondly, by the building which sheltered the tomb from the chief vicissitudes of atmospheric temperature, had developed, on either side of each, solid plates of rust, of from three to four times the thickness of the original iron. The slow formation of this oxide had acted as an irresistible wedge, riving the fabric asunder, and threatening in course of time the entire overthrow of this noble monument.

Specimens of these plates of oxide, as well as one of the original iron plates, were exhibited at the meeting of the Royal Archæological Institute, on the 2d of July last. The dangerous metal has now been replaced by plates of copper; and the tomb has been restored to its original beauty, but the lesson as to the conduct of iron when included in masonry or in mortar, even under circumstances which might be presumed to be more than ordinarily favorable, is not one of which any prudent architect or engineer will lose sight.

METAL SPINNING.

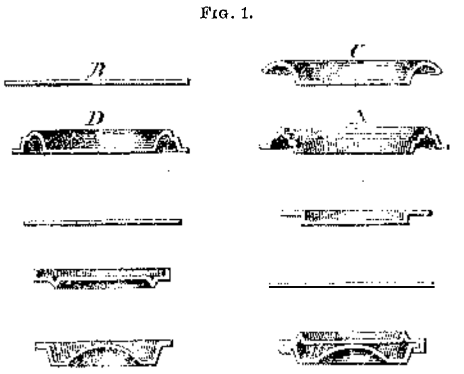
BY JOHN ANDERSON, C. E., IN THE CANTOR SERIES OF LECTURES BEFORE THE SOCIETY OF ARTS.

There is a system of operations for altering the shape of malleable metals, namely that of causing the sheet metal to conform or flow into hemispherical, oval, or irregular forms by motion, which was invented in France a few years ago, but which is now extensively adopted in England. The process is called "spinning," and is rapidly superseding the die-stamping method wherever it can be employed advantageously, because it acts more kindly on the metal. It is the result of gentle pressure combined with rapid motion, and involves a great principle; the effect is due to motion in connection with time. The chief feature in all such changing of form is the giving sufficient time for the particles to move or flow. To press the flow too rapidly would cause the sheet to tear from rupture of particles. In the operation of spinning, this tendency to tear is defeated by communicating a very rapid circular motion to the sheet of metal, and then by means of an instrument or instruments held in the hand, a gentle pressure is brought to bear on one point, thus causing a slight depression; but as the sheet is spinning at high velocity, the depression at once forms a circle, and so by continuing the pressure of the instrument it is molded into any form accordingly.

The operation of spinning is performed in a species of lathe. A mold of the required form is generally fixed on the end or face plate of the revolving spindle; the sheet or disk of metal is held by pressure from another headstock against the mold, and by the local pressure of the instrument is thus adroitly formed into the shape of the mold behind it.

On the table before us are specimens of the progressive manufacture of the lids of powder-cases, as they are made in the Royal Arsenal by this principle of operation, termed "spinning," by examining which its nature will be understood; it will also be seen how much change of form or rather movement among molecules, is requisite to produce the rigid or brittle condition that necessitates the annealing process, in order to restore the malleable and ductile property, which is required to still further change the shape. There is first the entire mouthpiece of the case in the form, here shown, in Fig. 1, ready to be attached to the flat surface of the case

FIG. 1.



top; the stationary part has reached its present peculiar shape A, through five stages. It is first cut into the flat disk, B, then the disk is spun, so far as C; it is now required to be annealed, and after this, it is turned into the third condition; it is then spun into the fourth stage, D, and from that to the finished article A. The lid which fits into A is composed of two separate pieces, both made by spinning from disks, and both pieces, when complete, are united by spinning over a lap of one upon the other. It will be observed that certain corrugations are produced by the process; these add greatly to the strength, but scarcely anything to the cost. It will also be seen how nicely the lid fits into the mouthpiece; this nice fit does not depend on the workmen, but wholly on the mold in the lathe, from which it is correctly transferred by copying, by the pressure of the spinning instrument.

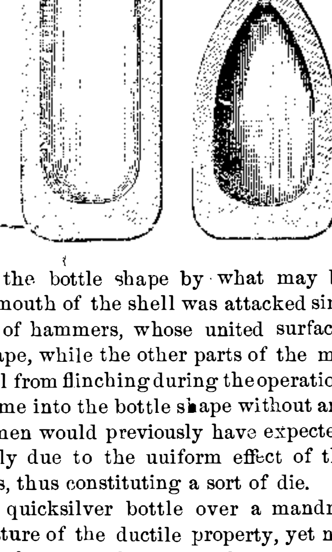
The French, who were the originators of the process, employ it with great dexterity in a variety of ways, more especially in the production of such articles as large oval dish-covers. The sheet is secured to the center of what may be called an oval chuck, and by a dexterous use of two pieces of greased box-wood held in both hands, the workman very cleverly prevents the sheet from puckering as he spins it into an oval, and finally turns over the outer edge into a border, thus giving it rigidity as well as a neat finish. The time required for the operation is so short as to be scarcely credible, and has to be seen to be appreciated.

The metal wrought-iron, as used by the smith, is also exceedingly malleable, both hot and cold, but especially when it is hot. All are familiar with this method in the condition called "tin plate," which is a thin sheet of iron spread out with rollers, afterwards cleaned, then covered with tin as a preservation from oxidation as well as for appearance, besides the facility which it affords for being united by solder in the hands of the tinman.

In the Great Exhibition of 1851, a foreign exhibitor had an iron book, in which the leaves were made of iron as thin as tissue paper; and iron may be seen of any substance or shape, every variety of bar, or, worthy of Vulcan, up to armor plates of 15 inches in thickness, or 25 feet long, 5 feet wide, and 8 inches thick, as made at the well-named "Cyclops" Works. Iron or steel may be drawn into gun barrels like dough over a mandrel, but one of the most marvelous illustrations of the malleable, ductile, and flowing properties of wrought-iron, is shown by the manufacture of quicksilver bottles. These bottles are made in various ways; in the process referred to, the bottle is made out of a circular disk of iron plate, which contains the quantity of iron necessary to form the article. By the stamping process already described, the disk of iron is gradually brought round to be of a cylinder shape, resembling the form of drinking glass called a tumbler. This cylinder is then put upon the end of a steel pin or mandrel, and by mechanical pressure, is pushed through a hole, which hole is smaller than its own dimension, thereby reducing its exterior diameter, but at the same time drawing or rather pushing the iron over the mandrel in the same manner as a piece of dough could be drawn over the finger to fit like a glove. This process is repeated through a succession of smaller and smaller holes, one after the other, until at length it becomes a long cylinder, close at one end but open at the other. The neck of the bottle has next to be formed on the same principle, by an often-repeated pressing and twisting at the open end into a conical die, by which means it is gradually and successfully brought to the form of the bottle neck, in which a screw is afterwards formed for the stopper by the ordinary means.

During the Crimean war, a large manufacture of wrought-iron shells was carried on in the Royal Arsenal, not precisely, but nearly in the same manner. They were made in an elongated form, and of an oval section, as shown on the diagram, Fig 2. These shells were made out of a single piece of iron, in which to form the cylinder, welding was so far employed, but were then brought to the bottle shape by what may be called hammers. The mouth of the shell was attacked simultaneously by a circle of hammers, whose united surfaces afforded the required shape, while the other parts of the machine prevented the shell from flinching during the operation, and thus it gradually came into the bottle shape without any puckering, which most men would previously have expected. Such a result was entirely due to the uniform effect of the combination of hammers, thus constituting a sort of die.

FIG. 2.



The elongation of a quicksilver bottle over a mandrel partly anticipates the nature of the ductile property, yet not entirely so. Ductility is that natural property by means of which a solid substance, such as iron, steel, and other metals, can be drawn or pulled out to almost any degree of fineness. This property, although often accompanying malleability, does not do so in some cases, such as in lead, possibly for want of tenacity, as lead can be squirted into any thread of any fineness by pressure. This natural property of ductility is taken advantage of to produce endless variety of form, but in all the mechanical principles employed are nearly alike—namely, to pull the metal through a rolling or stationary hole, and thus to alter its form or dimensions.

To take the simplest and most familiar case, that of common wire-making—the iron or other metal is first rolled out into a long bar of small diameter; the end of this bar is reduced in pointed fashion so as to enter a conical hole in a steel "draw-plate," as it is termed, the hole being smaller than the remainder of the bar; a pair of pincers worked by machinery seizes hold of the small end of the bar; the draw-plate is held rigidly; then the force applied is sufficient to overcome the unwillingness of the particles to move, but the flowing property permits the change, and the iron rod is thereby drawn out into a smaller and longer wire, which is repeated through smaller and smaller holes in succession, with occasional annealing, until at length the requisite fineness is arrived at. From this it will be seen that the shape of the wire depends on the form of the hole in the draw-plate, and may be to any pattern—sprigs of flowers for the calico printer, toothed-pinion steel wire for the watch and clock maker, or even tempered steel wire of all sizes for the piano-forte maker.

How Phosphorus is Made.

The earthy matter of bones consists of three equivalents of lime united with one equivalent of phosphoric acid. It is what chemists term "a tribasic phosphate of lime." Phosphoric acid consists of one equivalent of phosphorus united with five equivalents of oxygen. In order to obtain the phosphorus, it is only necessary to take away those five equivalents of oxygen, which we can do by mixing the compound with charcoal after some preliminary operations, and heating them together. The charcoal takes away the oxygen and forms carbonic oxide with it, while the phosphorus distils over. In this way we get phosphorus in the condition in which you are very familiar with it. It is a wax-like substance, which must be handled with care, because if you allow it to dry, the heat of the fingers would be sufficient to inflame it.

Now observe what this substance looks like. It is semi-transparent; it is soft; you can cut it like wax. It is exceedingly poisonous, and in the making of lucifer matches it is found to be a very insidious poison. Lucifer match makers are apt at first to be subject to an affection which does not draw much attention. They complain frequently of tooth-ache, but they do not know the insidious disease which is creeping upon them. The lucifer match makers who make lucifer matches from this phosphorus, are subject to the most distressing of all diseases; the jawbone becomes destroyed, and frequently disappears or becomes useless, and some of them spend the greater part of their lives in the wards of hospitals. It therefore became an important point for science to find some way by which this phosphorus should be deprived of its poisonous properties without losing those chemical characteristics which make it so useful in making matches for instantaneous light.

Prof. Schrotter, of Austria, met this want of science in a very skillful way, as follows: By taking common phosphorus and exposing it for some time to a temperature of 47°, this yellow, waxy, transparent substance transforms into a dark, brick-like substance. It is no longer so inflammable as to ignite spontaneously. It may be packed up in boxes without danger of spontaneous combustion; but what is more important, it has lost all its poisonous properties. The phosphorus, which was poisonous before, is no longer poisonous in this condition, and it is still capable of being used for making lucifer matches.

Raising of an Old War Ship.

In October 1779, says the Philadelphia *Age*, a British fleet, consisting of the *Roebuck*, 44 guns; *Meslim*, 18 guns, and a galley of 3 guns, commenced from the mouth of the Delaware a gradual approach to our city, which they proposed bombarding. To prevent this movement, the colonists had the famous little *Wasp* and the *Lexington*, with a few tenders; but they could only harass these vessels. But to prevent their upward progress, the Americans, as a further defense, constructed a fort on the lower end of Hog Island, and between that and the fort on the Jersey shore just opposite they sunk a number of hulks, thus preventing the passage up the river of any heavy vessel. On the 20th of October, 1779, the British vessels named attacked these forts, but a fleet of fire rafts drove them down the river.

On the 22d of the same month the new frigate *Augusta*, direct from England, reinforced the British force. She was one of the old-fashioned, cumbersome double-deckers, with high sides, bristling with guns. She was loaded with ammunition, shot, and a surplus armament for light ships, which the British hoped to construct on this side of the Atlantic.

The fleet, thus increased, re-attacked the fort on the Jersey shore, above Woodbury Creek, being coöperated with by 2,000 Hessians on shore, under command of General Danupe. The commander of the American galley *Chatham*, had twelve smaller galleys lying just below our city, and hearing of the approach of the British, dropped down stream, and on the afternoon of the 24th, opened the engagement with the four British frigates. This engagement lasted into the night, during which the *Augusta* grounded, and her consorts fled down the river. The *Augusta* was on the next morning discovered, attacked, and set on fire. Of the 300 men she had on board, just one half were drowned, by leaping ashore or being carried down by the frigate when she sunk. Here, in this mud bank, lying near the Jersey shore, opposite Hog Island, she has been embedded—the deposits accumulating, until the hull sat in the mire to the depth of fourteen feet.

About two weeks ago, James Powell, Jos. Moore, Geo. Murphy, Gabriel Sheppard, and Chas. Meyers, conceived the idea of raising the wreck and reaping pay for their labors by selling whatever it might contain. Submarine workers were employed; chains were passed beneath the old frame, and attached to canal boats on either side. The latter were partially filled with water, the cables passing under the hull of the wreck were tightened, and the water pumped out of the boats. The latter becoming buoyant rose up, and with them the remains of the *Augusta*, which finally were towed to Gloucester. Here, within the past few days, three of the old-fashioned guns were taken from her; a number of skulls, remnants of the ill-fated British; sixty tuns of shot, used in the small smooth bore cannon of the time; a great quantity of Kentledge ballast, consisting of blocks of cast iron, and a large number of relics, which will be highly prized. Among these were a silver spear, marked "H. W., 1748," a fat old bull's eye watch, with its works eaten up by rust, a number of guineas with a raised profile of George III., and some silver coin dated 1760. The frame of the *Augusta* is of Irish oak, and the wood is sound and proof against decomposition.

Curious Phenomenon in Artillery Firing.

A phenomenon connected with the fire of rifled artillery has lately been illustrated afresh by the experiments of the British Indian Equipment Committee. It is popularly believed that the projectiles from a rifled gun will have left the muzzle before any sensible recoil can take place; this is an error which was detected as follows: It had frequently been noticed that when rifled guns were fired point blank, or with the axis of the bore truly horizontal, the shot appeared to rise after it had left the muzzle, and the range was much greater than the theory would lead us to expect. This was at first ridiculed; the idea of a shot rising was preposterous and contrary to the first principles of dynamics. One might as well expect Newton's apple to rise in the air instead of tumbling to the ground. Facts, however, are stubborn, and it was asserted that, although theoretically it should not, practically the shot did rise. The first careful experiments in this direction made in this country were carried out by the late Ordnance Select Committee in 1864. The 12-pounder breech-loader rifled gun of eight cwt. was fired with an elongated shot of 11½ lbs., and a charge of ½lb., at an upright wooden target of forty yards. The gun was laid with the axis of the bore truly horizontal, that is, parallel with the ground, and the exact level of the center of the muzzle was taken on the target by a theodolite. Theoretically, the shot would fall by gravity in passing over the forty yards, and its center should have struck about two inches below the level; practically, however, it was found to strike ten inches above it! This fact once established beyond all doubt, many theorists set about accounting for it; their speculations, however, cannot here be recapitulated. The probable explanation is that the recoil is sensibly felt before the shot has left the gun, and that the resultant of the forces acting on the gun and carriage tends to throw the muzzle up—thus the projectile, although seemingly fired point blank, really leaves the gun at an angle. With the 12-pounder breech-loading gun this angle was found to equal about thirty minutes, while with the 9-pounder muzzle-loading Indian gun it equals only about thirteen minutes. The difference is probably due to the projectile taking a longer time to pass through the bore of the breech-loading gun. It may be mentioned that when the gun is swung as a pendulum and fired with its axis horizontal the shot strikes below the level.—*London Globe.*

Well Boring and Pumping Machinery.

An interesting paper on the above subject was recently read before the Institution of Mechanical Engineers, at Birmingham, England, by William Mather. In the operation of excavating boreholes for wells and other purposes, the principle adopted and carried out by the writer for all depths of boring has been the use of a rope for working the boring tool in the hole; and this principle obviates the serious expense and delay attending the plan of using rods for working the tool, when great depths of boring have to be executed. In the plan described in the paper, the boring tool is worked by a flat hemp rope, which is wound around the drum of a winding engine, and on quitting the drum passes over a large pulley carried in a fork at the top of the piston-rod of a vertical single-acting steam cylinder. The boring tool having been lowered by the winding drum to the bottom of the borehole, the rope is clamped secure at that length; steam is then admitted underneath the piston of the vertical cylinder, and the tool is lifted by the ascent of the piston-rod and pulley; and on arriving at the top of the stroke the exhaust valve is opened for the steam to escape, allowing the piston-rod and carrying pulley to fall freely with the boring tool, which falls with its full weight to the bottom of the borehole. A cushion of steam prevents the piston from striking the bottom of the cylinder, and the steam and exhaust valves are worked by tappets on a plug-rod; a rapid succession of blows is thus given by the boring tool on the bottom of the borehole. The boring tool is composed of a number of chisels or cutters, fixed in the cast-iron head at the bottom of the long wrough-iron boring bar, which is guided vertically in the borehole by a couple of collars; and it is made to rotate a little between each blow, so as to strike in a fresh place each time, by means of a simple self-acting arrangement. The lifting shackle at the top of the boring bar is allowed to slide up and down through a short distance on the neck of the boring bar between two fixed collars; the upper face of the lower collar is formed with ratchet-teeth, and the under face of the top collar is formed with similar ratchet-teeth, but set half a turn in advance of the teeth on the lower collar. The intervening boss of the lifting shackle is also formed with corresponding ratchet-teeth on both its upper and lower faces, these teeth being in a line with one another. When the boring tool falls and strikes the blow, the lifting shackle, which during the lifting has been engaged with the rachet-teeth of the top collar, falls upon those of the bottom collar, and thereby receives a twist backwards through the space of half a tooth; and on commencing to lift again, the shackle rising up against the rachet-teeth of the top collar receives a further twist backwards through half a tooth. The flat rope is thus twisted backwards to the extent of one tooth of the ratchet, and during the lifting of the tool it untwists itself again, thereby rotating the boring tool forwards through that extent of twist between each successive blow of the tool; and this turning is found to be quite certain and continuous in action during the working of the tool. When a sufficient quantity of material has been broken up at the bottom of the borehole by the blows of the tool, the working of the percussion cylinder and pulley is stopped, the rope unclamped, and the boring tool wound up with great rapidity by the winding drum. A shell-pump is then lowered down the borehole by the rope, consisting of a long cylindrical shell or barrel, with a clack valve at the bottom opening inwards, and a bucket, containing flap valves opening upwards. The rope is attached to the bucket, and when the pump reaches the bottom, the bucket is worked up and down by the rope several times, so as to draw in the broken material through the bottom clack; after which the pump is drawn up again with the material contained in it, and the boring tool again lowered into the hole for continuing the boring. In the event of accidents from breakages or from any of the implements sticking fast in the borehole in rising, grappling tools with hooked claws of suitable shape are employed for laying hold of the obstacle and raising it; or if it cannot be brought up by this means, a solid wrought iron breaking bar, of very great weight is lowered into the hole, and allowed to fall upon the obstacle from a sufficient hight to break it up into fragments, which are then raised either by grappling tools or by the shell pump.

Ransome's Induration Process.

We learn from *Engineering* that Mr. Ransome's method of waterproofing walls by means of successive solutions of silicate of soda and chloride of calcium, which has been applied with so much success to many public and private buildings in England, is being used extensively in India to arrest the decay of many brick structures upon railways in that country. Among others it mentions the Waree Bunder Works, upon the Great Indian Peninsula Railway, which were constructed of such inferior material that a rapid deterioration speedily followed the construction of the works, and the crumbling of the bricks left no alternative apparent save that of rebuilding. It was, however, determined to experiment with Mr. Ransome's process, and accordingly, in 1868, it was extensively applied to the failing buildings, with the result of effectually stopping the decay, and of placing so fine and hard a surface upon the bricks that the material, which before could be crumbled by the touch, received a sur face so hard as to resist the scratching from a steel point. In this manner extensive workshops and a chimney shaft were, at an insignificant outlay, rescued from destruction, and rendered sound and durable.

Heating Surface of Boilers.

The quantity of steam generally produced on every 39 inches square of surface or cylinder boilers, is from 44 to 66 pounds per hour. In marine boilers it averages about 77 pounds per hour.

For high-pressure engines, the heating surface is generally calculated, per horse power, as follows: Small boilers, 85 inches; medium size, 55 inches; large size, 40 inches, and even less.

For low-pressure engines, per horse power, as follows: Small boilers, 60 inches; medium sized, 40 inches; large size, 39 inches, and even less.

Recent comparative experiments have shown that 42 feet of boiler surface made 22 pounds of steam from 35·2 pounds of coal; 52·5 feet surface made 220 pounds of steam from 30·75 pounds of coal; 63 feet surface made 220 pounds of steam from 29 pounds of coal; 84 feet surface made 220 pounds of steam from 27·55 pounds of coal; 105 feet surface made 220 pounds of steam from 27·21 pounds of coal.—*Deby's Steam Vade Mecum.*

Preservation of Eggs.

The *Journal de Pharmacie et de Chimie* contains an account of some experiments by M. H. Violette, on the best method of preserving eggs, a subject of much importance to France. Many methods had been tried: continued immersion in lime-water or salt water; exclusion of air by water, sawdust, etc., and even varnishing had been tried, but respectively condemned. The simplicity of the method adopted in many farms—namely, that of closing the pores of the shell with grease or oil had, however, attracted the attention of the author, who draws the following conclusions from a series of experiments on this method: Vegetable oils, more especially linseed, simply rubbed on to the egg hinders any alteration for a sufficiently extensive period, and presents a very simple and efficacious method of preservation, eclipsing any methods hitherto recommended or practiced.

Watch Repairers' Shop.

A correspondent in the *Horological Journal* makes the following practical suggestions:

"How vexatious to drop a small article and spend a quarter of an hour of valuable time in fruitless search for it—getting on your knees, dirtying your pants, growing red in the face, partly from your inverted position, and partly from anger. All this may be easily avoided. Thus:

"First, sweep very clean every nook, and corner, and crack about your bench and window, then get a pound or two of putty (no matter 'what's the price of putty'), and a few strips of nice soft pine, then putty up every crevice that is large enough to conceal a jewel screw; the large cracks stop partially with bits of pine and finish with putty; don't miss a single place. The whole job won't take you longer than you will be searching for a lost second-hand, and then when anything does drop, you can find it in a moment by sweeping your floor with a little broom brush."

Our Impending Doom.

A public lecturer in this city recently argued that religion was useless because "man's existence on the earth is momentary. Science teaches us that in 6,300 years more a grand deluge will end his race and make him a fossil. You may think this an idle tale, but it is not. Astronomy shows that the earth is oscillating in the angle of its axis to the sun in periods of 21 000 years. The zones are undergoing a constant change. Now, at the North Pole it is growing colder each year, and at the South Pole warmer. Thus, an immense accumulation of glaciers or icebergs at the North Pole will result, while at the South they will not form at all. In 6,300 years the glaciers will have accumulated so much that they will suddenly over-balance the earth. Then the waters of the sea will rush from the south to the north, and there will be a deluge." Stand from under!

THE yearly mortality of the globe is 33,333,333 persons. This is at the rate of 91,554 per day, 3,830 per hour, 63 per minute.

H. W. STAPLES' AUTOMATIC LAMP-FILLER.

In our description of this invention published on page 344, current volume (issue of Nov. 27, 1869), an important point claimed by the inventor was omitted. If the reader will again refer to the engraving he will see that the vent tube, which also acts as a brace bewteen the nozzle and breast of the can, terminates at the letter A, which represents an opening in the side of the nozzle, through which air enters while the oil is flowing out of the nozzle. As soon, however, as the oil rises in the lamp as high as the vent hole, A, it covers this hole, and the flow of oil from the filler is checked. The fluid as it flows over the end of the vent tube, produces an audible whistling sound, which ceases when the vent hole is stopped by the rising of the fluid in the lamp, as the flow then ceases.

Thus a metal lamp or one made of any opaque material, as well as one of transparent glass, can be filled without danger of its running over, the filler stopping automatically when the lamp is filled to the proper hight. The advantage of controlling the flow is gained by the simplest means, and all danger of overflow prevented.

Editorial Summary.

FROST CRYSTALS UPON DRIED GRASS.—Several persons have by this time laid up to put into bouquets the beautiful grasses which they gathered in the autumn and summer of the present year. In order to add variety and some pleasing effects to portions of such grasses, they may be covered with imitation frost-crystals, some white, others blue-green, and amber. To crystallize dry grass white, steep it in a solution of one pint of hot water containing one pound of alum. As it becomes cold, crystals will adhere to the grass, which will increase in size if left for a day or more; but small crystals look the best; and in order to keep them so, the grass should be often moved and turned about. When taken out of the solution and dried in the air, they are fit for mounting with the other grasses, and greatly add to their beauty. For the blue-green crystals use sulphate of copper, and for amber crystals use chromate of potash instead of the alum. Feathers may also be crystallized in the same way. Art and taste will arrange them into forms of beauty.—*Septimus Piesse.*

A NEW THING IN POSTAGE.—The Austrian Government has introduced a novelty in postage, which might be introduced with great benefit in all countries. The object is to enable persons to send off, with the least possible trouble, messages of small importance, without the trouble of obtaining paper, pens, and envelopes. Cards of a fixed size are sold at all the post offices for two kreutzers, one side being for the address and the other for the note, which may be written either with ink or with any kind of pencil. It is thrown into the box, and delivered without envelopes. A halfpenny post of this kind would certainly be very convenient, especially in large towns, and a man of business, carrying a few such cards in his pocketbook, would find them very useful. There is an additional advantage attaching to the card, namely, that of having the address and postmark inseparably fixed to the note.

TO CURE THE RANK SMELL OF HORSE STABLES.—Saw-dust, wetted with sulphuric acid, diluted with forty parts of water and distributed about horse stables will, it is said, remove the disagreeable ammonical smell, the sulphuric acid combining with the ammonia to form a salt. Chloride of lime slowly evolves chlorine which will do the same thing, but then the chlorine smells worse than the ammonia. Sulphuric acid on the contrary is perfectly inodorous. The mixture should be kept in shallow earthenware vessels. The sulphuric acid used alone, either diluted or strong, would absorb more or less of the ammonia, but there would be danger of spiling it about and causing serious damages, and besides this the sawdust offers a large surface to the floating gas. The experiment is easily tried, and it may prove successful.

THE Boston *Advertiser* reports that a curious phenomenon is frequently taking place at Machiasport, Maine, in the harbor opposite the wharves. It is an upheaval, by some power altogether unknown, of vast quantities of water, mud, and stones, to the distance of many feet, and with a furious rushing noise. This phenomenon has occurred quite a number of times during the summer, and once as late as a month ago.

PATENT CLAIMS.—Persons desiring the weekly official list of patent claims, are referred to a notice concerning the supplying of them in our advertising columns. The Commissioner of Patents would deem it a special favor if parties who intend to subscribe would order immediately, so that he may know how large an edition to publish.

A CORRESPONDENT of the *Mechanics' Magazine* states that the Moncrieff system of mounting artillery, which has lately attracted so much attention abroad, was anticipated 1811, by a French officer, who published a system of mounting guns not essentially different from that of Capt. Moncrieff.

BLACK PAINT FOR IRONWORK.—A varnish for ironwork can be made as follows: Obtain some good clean gas tar, and boil for four or five hours, until it runs as fine as water; then add one quart of turpentine to a gallon of tar, and boil another half hour. Apply hot.

THE following is a German recipe for coating wood with a substance as hard as stone: 40 parts of chalk, 50 of resin, and 4 of linseed oil, melted together; to this should be added one part of oxide of copper, and afterwards one part of sulphuric acid. This last ingredient must be added carefully. The mixture, while hot, is applied with a brush.