

power which wearies and wears, and cannot be continuously employed in a single direction without fatigue. The wise Solomon saw that much study is a weariness to the flesh. And modern physiologists have not failed to see that undue manual labor impoverishes and enfeebles the mind.

The will concentrated long upon compelling the muscles to perform a certain routine of movement, finds itself at length powerless to command. It must then cease exertion entirely as in sleep, or it must exert itself in some new direction. This is what is commonly called recreation, that is, an occupation which affords an agreeable contrast to that which has caused fatigue.

We think it is indisputable that any employment which exacts moderate muscular activity, at the same time interesting the mind by employing its powers upon such topics as do not arouse the animal passions, while they moderately engage the higher mental powers, has in it all the elements of healthy recreation. In our opinion nothing whatever so combines these elements and furnishes so cheaply the needed relief to professional men and hard students as some mechanical occupation, in which originality of design may be united with manual skill in execution.

In such recreation the entire tendency is to gratefully relieve the mind, gently exercise and invigorate the body, and build out and cultivate powers which cannot be developed to the moral hurt of the individual, but greatly increase his intellectual stature.

In such occupations the mind wearied with business cares, or by much study, may revel in refreshing beauties of form, color, and motion, and find the highest of all pleasures in the contemplation of the relation of simple causes to complex effects.

A man who has in this way attained to even moderate skill, may find his lathe a magical instrument by which he can clothe the rudest materials with forms of beauty, and gratify to the utmost that wonderful combination of faculties by which man most asserts his superiority over the brutes.

Imagination here finds, if not so wide a scope as in poetry, or the fine arts, sufficient to give it ample employ, and to banish from the mind all evil thinking and day dreaming, which to the young mind is always hurtful and sometimes fatal.

On this latter account we recommend most earnestly mechanical recreation for the young. Let the boys build windmills and miniature dams. They soil their clothes, but how much better soiled garments than soiled minds. They may cut their fingers with the tools you permit them to employ, but you will find such wounds heal in less time than the foul ulcers of moral corruption.

Every man who can afford it should supply his boys with tools, and a room where they may be used and cared for. A boy takes to tools as naturally as to green apples, or surreptitious and forbidden amusements; and ten to one if he has a chance to develop his mechanical tastes and gratify them to their full extent, his tendencies to vicious courses will remain undeveloped. Such a result is enough to compensate for all the expense and trouble the indulgence we recommend would entail; while the chances that the early development of his constructive faculties may in this mechanical age be the means by which he may ultimately climb to fame and fortune are not small.

#### CURIOUS ASSOCIATIONS AMONG ANIMALS.

In the palmy days of Barnum's Museum, one of its chief attractions was what was called "The Happy Family," composed of a large number of abjectly miserable animals, generally supposed to have a natural antipathy for each other's society, living together on compulsion, and whose manifestations of stupid tolerance were accepted by the country visitors to that great institution, as indisputable evidence of their blissful state of mind, and the regenerate condition of their hearts.

Once, while on a visit to the collection alluded to, we remarked a good clergyman, evidently hailing from some remote rural location, highly delighted in the contemplation of "The Happy Family," who remarked, somewhat in the style of the venerable Chadband, "Herein we see a type of the fulfillment of the blessed prophecy, that the 'Lion shall lie down with the lamb.'"

Just at the moment, one of the keepers chanced to pass. At the sight of his familiar face, the wretched little dog—whose confinement had not obliterated fond memories of past days, when he might roam and frisk at will, and choose his own society—rushed frantically to the bars of the cage with doleful cries and piteous pleadings, thrusting out his helpless little paws in vain appeal to be released. It was quite affecting to witness the expression of stolid despair in his little brute countenance, when he found no notice was taken of his petition, and the desperate way in which he walked to a partially secluded corner and threw himself prone, as though all hope had fled. The little episode was not without its effect upon the bystanders; and the clergyman referred to, evinced his goodness of heart by loudly denouncing the affair as a cruel exhibition, in which verdict we heartily concurred.

If the reader will follow us for a little while, we will introduce him to some more curious associations than Barnum's Museum ever displayed; associations originating in the common interest of the parties to them, or in the desire to relieve the oppressive sense of solitude which even the lower animals seem to feel.

The well-known associations of parasites with the animals upon whom they prey, are the most unpleasant and disgusting, as they are the most familiar examples of animal companionships. These are only in the interest of one of the parties, and are generally strongly objected to by those who thus find disagreeable company thrust upon them.

We shall find a more pleasant, if not a more instructive field of contemplation in those voluntary associations and attachments which animals of different species form with and for each other.

Foremost among these is the companionship of domestic animals with man. Familiar as household words are the innumerable stories of faithful attachments mutually existing between man and the dumb creatures, which so largely contribute to his sustenance, protection, and pleasure.

Scarcely less familiar are the stories of apparently incongruous attachments between dogs and cats, cats and mice, fowls of different species, etc. Riding once along one of the pleasant drives radiating from Saratoga Springs, we saw the comical spectacle of a pig sweetly sleeping, literally in the arms of a fond calf. These two creatures, cut off from all society by the external limits of a lonely farmyard had become all in all to each other, and shared their "bit and sup," and their quiet couch in the sunny corner, with mutual satisfaction. Very many similar instances of unusual attachments between domestic animals might be enumerated, but we wish, more particularly, to call attention to such associations as are made, apparently through the instinctive consciousness that a common benefit may accrue from a union of diverse gifts and powers.

For this purpose we find a rich collation of facts, ready to hand, in a paper not long since read before the Belgian Academy, by P. J. Von Beneden, on "Animals as Fellow Boarders." We are to tell, that the *Donzelle*, a graceful little fish, found in different seas, takes up its abode in the stomachs of the sea cucumbers, and that these lodgings are shared by prawns and pea crabs, dining together on the abundant stock of food which the sea cucumbers—being excellent fishers—provide.

In the Indian seas, a modest little fish with an extensive scientific appellation, lodges habitually under a star fish, and feeds on the crumbs which fall from the table of his patron. A Siluroid, of Brazil, of the genus *Platyostoma*, lodges a species of very small fish in its mouth and shares its daily food with its *protège*.

Other instances of mouth lodgers might be mentioned; even Crustacea taking advantage, in this way, of the superior predatory ability of more active creatures. In the China seas Dr. Collingwood found an anemone, in whose interior little fish resided, whose name he did not know, but which seemed content and happy in their curious abode. The pea crab lives in mussel shells, and picks up a comfortable living without in the least injuring its hospitable entertainers. The ancients, we are told, thought that the mollusks, having no eyes, were glad to avail themselves of these little crabs, but the probabilities are, that the crabs eyes are employed solely for their own benefit. Like other crustaceans, of the same rank, says Von Beneden, "these little creatures carry on each side of the shell, at the end of a movable stalk or support, a charming little globe, furnished with hundreds of eyes, which they can direct, as an astronomer turns his telescope, to any part of the firmament. What cannot be doubted is, that the little intruders live on perfectly good terms with the mussels and if the latter supply a convenient and safe lodging, they, on their side, profit largely by the morsels which fall from the claws of their guests, who are well placed and well provided with prey-catching apparatus. Snugly seated in their living house at the bottom of the sea, they possess a movable lair which the mussel carries about, and they can choose the best moment for attack, and fall upon the enemy unawares."

But the most remarkable instance of association for mental profit, is that of the hermit crab. These creatures are decapod crustaceans, somewhat resembling miniature lobsters, who make their abode in deserted shells, and change both their skin and their dwelling as they increase in size. The young ones are contented with very small habitations. The shells they inhabit are derelicts they find at the bottom of the sea, and in which they conceal their weakness and personal disadvantages with obstinate persistence.

These singular creatures have too soft an abdomen to confront the dangers they encounter in their incessant wars, and the shells in which they thrust themselves supply at once lodgings and shields. Armed thus from head to foot the soldier crab marches proudly against his enemies, and fears no danger, because he has a secure retreat. But this soldier, or hermit crab, is not alone in his dwelling. He is not an anchorite like those dwelling in air, for by his side a worm is commonly installed as fellow-boarder with him, forming one of the most remarkable associations which is known. The companion worm is elongated like all the Nereids, and its supple, undulating body is armed along its sides with bundles of lances, pikes, and daggers, the wounds from which are very dangerous. The crab, ensconced in his borrowed armor, and flanked by his terrible acolyte, attacks all he finds before him, and knows no reverse. Thus, around his domain, we observe a prosperity not seen elsewhere, and on his shell there usually flourishes a whole colony of Hydractinia, blooming like a flower-bed, and inside we often find Peltogaster, Lyriope, and other Crustaceans, who convert it into a true pandemonium.

Besides many other associations formed with various species of soldier crabs, there are barnacles, which lodge on the skin of the whale, in company with whale lice and other marine creatures, worms which live as companions in the same sheath with their congeners, and even with included mollusks; creatures which live in freedom in their youth, but, when they approach to maturity, throw away their legs and eyes, change their clothes, and attach themselves permanently to some animal upon which they are ever after wholly dependent.

The Remora, an animal found in the waters of the Mediterranean, attaches itself with vigor to other animals by means

of an apparatus attached to its head, and the inhabitants of Mozambique make use of this habit to entrap fish and other marine animals. They catch Remoras, put rings in their tails, attach lines to the rings, and cast the Remoras forth into the sea. Presently the Remora will have stuck to something and is drawn in by the tail, holding fast to the creature it has unintentionally brought to grief.

But we cannot dwell longer upon these curious associations. Our readers will agree with us, that they afford food for much profitable reflection, and that they may instruct as well as amuse. They teach how ample is the provision made for the sustenance and protection of the myriad creatures which people our globe, and lead to the belief that these wondrous provisions cannot be alone confined to this little mustard seed of a planet, among the magnificent heavenly bodies that circle together around the great life-giving, life-sustaining sun.

#### CHEMISTRY OF ZIRCONIUM.

Dr. Ernest Melliss has published "Contributions to the Chemistry of Zirconium" that contain much new matter; and as this element is now employed in the zirconium light, it may be of interest to know something more about it than we can learn from any books on chemistry.

There are scarcely more than a dozen minerals that contain zirconium, the most important of which is the zircon, which is so called because it was used as a false jewel, and received the name jargon, or zircon, from dealers in precious stones. There are fine specimens of this mineral in North Carolina, New York, New Jersey, and Pennsylvania.

The pure zircon contains 66.96 per cent oxide of zirconium and 33.04 per cent silica; its specific gravity is 4.05 to 4.75. From this mineral the metal zirconium and all of its compounds are prepared. It is heated to redness and quenched in water so as to be easily pulverized, and the fine powder is mixed with four times its weight of carbonate of soda, and fused in a platinum crucible. The mass from the crucible is treated with hydrochloric acid, evaporated to dryness to separate the silica, again dissolved, and the oxide of zirconium precipitated by ammonia.

By mixing the powdered zircon with carbon, and passing chlorine gas over it, the chloride of zirconium can be formed along with the chloride of silicon, which latter being very volatile, can be expelled by heat, leaving behind the zirconium salt nearly pure.

The resolution of the mineral by fluoride of potassium has also been recommended, but the best method appears to be to fuse it with bisulphate of potash, and thus on subsequent treatment with sulphuric acid to convert it into pure basic sulphate of zirconia.

The reducing agent employed in the preparation of metallic zirconium is aluminum, and the operation is interesting as being applicable to other metallurgical processes. The double fluoride of zirconium and potassium is first prepared by dissolving the oxide in hydrofluoric acid and pouring the liquid into a concentrated solution of neutral fluoride of potassium. The precipitate thus formed is well dried and intimately mixed with twice its weight of finely-divided aluminum, and exposed in a gas carbon crucible to a heat sufficient to melt copper.

The zirconium will be found in the form of leaves and scales penetrating the aluminum, which remain after dissolving out the aluminum by hydrochloric acid. The metal is hard, and crystalline, like antimony, with the specific gravity of 4.15. It is said to exist in three states the same as silicium and boron, namely, amorphous, graphitoid, and crystalline, and is less fusible than silicium, and burns only at the temperature of the oxyhydrogen blow pipe.

No uses have thus far been suggested for zirconium, and, in fact, it has been too little studied to enable us to speak with certainty about it. In consequence of some of its chemical relations it is now classed with tin, titanium, thorium, columbium, and tantalum; while by other writers it is put in the same group with carbon, boron, and silicon, instead of with aluminum as formerly.

The oxide of zirconium is now employed to point the pencils used in the oxyhydrogen light. It is said not to waste away as magnesia and lime do; but the cost of the oxide and the trouble to prepare it must stand in the way of its general adoption.

Dr. Sorby about a year since published an account of the discovery of a new metal associated with zirconium, which he called "jargonium," but recently he announced his mistake. The reactions attributed by him in the first instance to jargonium he now finds are, in fact, owing to the presence of a small quantity of the oxide of uranium in the mineral zircon, and the supposed new metal must therefore be erased from our list. The compounds of zirconium have thus far no interest in the arts.

#### SCIENTIFIC INTELLIGENCE.

##### HEATING WITH GAS.

MM. Jacquet and Hauteur, in Paris, have invented a method for heating with gas by reflection, which seems to offer some advantages over previous attempts in this direction. The gas burns with inverted flame, and a double hearth below the burner to absorb all of the products of combustion. The hearth, which is not in sight, throws off all of its heat and light by reflection from a series of mirrors made of red copper, and the effect is said to be remarkable. It is difficult without diagrams to convey a perfect idea of the invention, which is said to be applicable to all kinds of cooking and heating purposes.

##### TEST FOR SMALL QUANTITIES OF ALCOHOL.

A few drops of the liquid to be tested are poured into a

test tube with a small quantity of iodine and several drops of caustic soda on potash, and gently heated. If there is any alcohol present a characteristic yellow crystalline precipitate of iodide of formyle is produced. According to Lieben, the presence of one part of alcohol in 2,000 parts of water can be recognized in this way.

#### EMPLOYMENT OF PHOSPHATES AS MORDANTS.

M. Collas proposes to employ phosphates as substitutes for alum. The goods to be dyed are immersed in a bath of acid phosphate of lime or magnesia, afterwards in a bath of coloring matter, and finally into an alkaline solution. The process is said to be particularly applicable to aniline colors, more especially to aniline purple. Lakes can also be prepared by use of phosphates, preferably phosphate of lime. Thus to prepare a lake of cochineal an infusion of the color is first made ready and a gelatinous precipitate of phosphate is added, the mixture is powerfully agitated for some time. The coloring matter will be found to be as completely precipitated as it is with alumina. Insoluble coloring matters can be used for dyeing by employing gelatin in combination with the phosphate of lime.

#### COBALT AND MANGANESE.

M. Valenciennes recently presented to the Academy of Sciences, Paris, specimens of pure cobalt and manganese—prepared by reduction in magnesia crucibles. The cobalt had the appearance of polished iron, and when turned in the lathe yielded chips similar to those produced from iron of best quality.

The manganese can be easily broken with a hammer, and exhibits on a fresh fracture a perfectly white color. It alters rapidly in the air, changing into an intermediate red oxide. Cobalt combines more readily with copper than with iron; the alloy melts at the temperature of fusion of copper, and is malleable and ductile if properly annealed. Manganese has great affinity for copper, and five samples were made, containing 3, 5, 8, 12, and 15 per cent of manganese—all of them resembled bronze, are hard, sonorous, and easily fused. The alloy containing 15 per cent of manganese was white like steel, and unaltered after long exposure, and was very hard.

The alloys of 3, 5, and 8 per cent are ductile, and can be reduced to as thin leaves as tin. According to M. Valenciennes the alloys of manganese and copper are capable of extensive uses in the arts if they can be prepared in an economical way.

#### ZINC REFUSE FROM GALVANIZING IRON.

The zinc refuse contains chlorides, oxychlorides, and oxide of zinc, together with some sal ammoniac. Pattinson fuses it with an equivalent proportion of lime by which the ammonia can be saved and the zinc obtained as an oxide.

#### The Hartford Steam Boiler Inspection and Insurance Company.

The Hartford Steam Boiler Inspection and Insurance Company make the following report of their inspections for the month of March, 1870:

During the month, 458 visits of inspection have been made; 784 boilers examined, 731 externally and 224 internally; while 69 have been tested by hydraulic pressure. The number of defects in all discovered, 482; of which 60 are regarded as dangerous. The defects in detail are as follows:

Furnaces out of shape, 7—1 dangerous; fractures in all, 30—7 dangerous; burned plates, 26—5 dangerous; blistered plates, 73—15 dangerous; cases of incrustation and scale, 81—12 dangerous; cases of sediment and deposit, 5; cases of external corrosion, 34—4 dangerous; internal corrosion, 6—5 dangerous; cases of internal grooving, 7—1 dangerous; water gages out of order, 25; blow-out apparatus out of order, 7—1 dangerous; safety valves overloaded 24—1 dangerous; pressure gages out of order, 92—2 dangerous. These varied from—10 to +25. Tubes corroded off near tube sheet, 1—1 dangerous; boilers malconstructed, 1—regarded as dangerous; boilers condemned as unsafe and beyond repair, 4. A large number of leaky boilers were reported, some had become so from blowing down and immediately filling up with cold water—this practice will ruin the best boiler in a short time. Before refilling, the boiler should be allowed to become quite cool. The accumulation of sediment about the tubes, keeping the water therefrom, is a source of evil; tubes become burned and corroded, and leaks will of necessity follow.

Steam gages, it will be noticed, have been found out of order in numerous instances. There is no way of ascertaining these variations except by frequent tests, and although they may be light in many instances, in some they are positively dangerous; for instance, if a boiler is being run by the gage at a pressure of 85 pounds, and the gage is 20 pounds "heavy or slow," the actual pressure used is 105 pounds, which may be far beyond the safe limit, hence it is important that these indicators should be often examined.

We had not room for further comment, but the intelligent engineer will see that the boilers under his care are free from the defects and dangers enumerated above.

#### Earthquake in Guayaquil.

In Guayaquil, between Point Pasado and Point Venado a peculiar volcanic movement has taken place. In a space of two leagues the surface of the earth undulated slowly, and great chasms and deep circular excavations were opened. A new lagoon was formed, and between the shore and the sea there appeared a large sized hill.

During all this fearful commotion, the hills along the coast were observed to be in a state of unrest, and large land slides took place, carrying with them rocks and trees.

For four days this agitation continued, the undulation being from west to east. These phenomena took place early in the month of March. It would seem from this that the throes

of the earth which, a year or two ago, sent desolation and death through some of the most populous districts of South America, are not wholly spent.

#### Some Hints about Screws.

Where screws are driven into soft wood and subjected to considerable strain, they are very likely to work loose; and it is often difficult to make them hold. In such cases, says the *Canadian Builder*, we have always found the use of glue profitable. Prepare the glue thick; immerse a stick about half the size of the screw and put it into the hole; then immerse the screw, and drive it home as quickly as possible. When there is an article of furniture to be hastily repaired, and no glue is to be had handily, insert the stick, fill the rest of the cavity with pulverized resin, then heat the screw sufficient to melt the resin as it is driven in. Chairs, tables, lounges, etc., are continually getting out of order in every house; and the proper time to prepare them is when first noticed. If neglected the matter grows still worse, and finally results in laying by the article of furniture as worthless. Where screws are driven into wood for temporary purposes they can be removed much easier by dipping them in oil before inserting.

When buying screws notice what you are getting; for there are poor as well as good kinds. See that the heads are sound and well cut; that there are no flaws in the body or thread part, and that they have gimlet points. A screw of good make will drive into oak as easy as others into pine, and will endure having twice the force brought against it.

#### Safety House Lamp.

The article of a safety kerosene lamp is one of importance to nearly every person. It is a subject of vital interest to every household. From the number of inquiries at this office for information as to lamps possessing safety qualities, we conclude that the public are not satisfied with what the manufacturers generally supply.

A few days ago a circular, advertising Perkins & House's safety lamp, was put into our hands, containing references to a number of distinguished gentlemen whose testimonials were appended. We took occasion to interview one of them—the president of one of our prominent New England colleges—as to the merits of this lamp, and asked if on further use he was satisfied that he had not expressed too much in its praise in his testimonial. His reply was, "No; it has given perfect satisfaction, and I think the lamp superior in respect to safety, perfect combustion, freedom from odor, and amount of light given, to any lamp."

From the high and direct source this testimony comes, we think there is no doubt but that the Perkins & House lamp, advertised in another page by Votaw, Montgomery & Co. possesses all the qualities that the advertisers state.

#### Iceland Spar.

Joseph D. Price and Benjamin Shunk, of Harrisburgh, Rockingham Co., Va., have discovered in that town large deposits of calcite (carbonate of lime) of the Iceland spar variety. We have received some specimens of the crystals (rhombohedral), which are clear and excellent. A quarry has been opened and the deposit examined to an extent exceeding eighty acres. The deposit is six feet deep, and promises to be valuable; but the manner of mining and working the mineral is not very well understood in that region.

#### Steam Omnibuses.

It is said that a company has been organized in Montreal to introduce into that city Thompson's road steamers for passenger traffic. Our readers will recollect one of these vehicles was tried not long since in Edinburgh, Scotland, where its inventor resides, and was stated to have behaved very satisfactorily. The traction wheels are fitted with broad and thick rubber rims, which enable them to conform to the uneven surfaces of common roads, and prevent slipping.

**THE EAST RIVER BRIDGE.**—The great caisson for the Brooklyn side of the East River Bridge, the successful launching of which we recently announced, has since our last issue been towed out to its final resting place, and will probably be sunk before this paragraph meets the eyes of our readers. The most perfect success has thus far attended every step in this great work, and everything shows that engineering skill of the highest order is guiding its progress.

#### UNITED STATES DISTRICT COURT—SOUTHERN DISTRICT. BEFORE JUDGE BLATCHFORD. PATENT FOR MAKING VENEERS.

*Carmi Hart vs. Jeryleman Shaw and Sathiel E. Nickerson.*—This was a bill filed by the complainant to restrain the infringement of a patent issued to him on April 4, 1854, and renewed March 16, 1868, for an improved machine for cutting veneers.

The substance of the invention was placing the log upon a table so that it could be brought against the knife to cut off the veneer at different angles, according to the requirements of the material, and suspending it by clamps, so that when it was being carried back to meet the knife again, it would not bear upon the edge of the knife.

The defendants set up a want of novelty in the invention, and denied any infringement on their part.

*Held by the Court.*—That on the evidence the defense of want of novelty in the invention fails. That in the defendant's machine the same results claimed by the plaintiff are produced by devices which are mechanical equivalents for those of the plaintiff. Decree for plaintiff. For plaintiff, E. Y. Bell; for defendants, T. M. Wyatt.

#### APPLICATIONS FOR EXTENSION OF PATENTS.

**PEGGING JACKS.**—Alfred Bailey, Amesbury, Mass., has petitioned for the extension of the above patent. Day of hearing July 13, 1870.

**MACHINE FOR MANUFACTURING SPOOLS.**—A. D. Waymoth, Fitchburg, Mass., has petitioned for an extension of the above patent. Day of hearing July 13, 1870.

**MACHINERY FOR FORMING HAT BODIES.**—Alva B. Taylor, Newark, N. J., has petitioned for an extension of the above patent. Day of hearing July 13, 1870.

**WATER CLOSETS.**—William S. Carr, New York city, has applied for an extension of the above patent. Day of hearing July 20, 1870.

**ROTARY KNITTING MACHINES.**—Sidney W. Park, Albany, N. Y., and Edgar S. Ellis, Fremont, N. Y., have applied for an extension of the above patent. Day of hearing July 20, 1870.

**LIGHTNING ROD.**—David Munson, Indianapolis, Ind., has applied for an extension of the above patent. Day of hearing July 20, 1870.

**CART SADDLES.**—Henry A. Rains, Bloomfield, N. J., has petitioned for an extension of the above patent. Day of hearing August 3, 1870.

#### Recent American and Foreign Patents.

*Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.*

**WASHING MACHINE.**—Charles Bean and Suel Logee, East Douglass, Mass.—This invention has for its object to furnish an improved washing machine which shall be simple in construction and effective in operation, washing the clothes quickly and thoroughly, and without injuring them.

**EARTH CHAMBERS.**—William H. Bliss, Newport, R. I.—This invention has for its object to furnish an improved earth chamber or portable earth closet which shall be simple in construction and effective in operation, wholly preventing the escape of any offensive odor into the room.

**EXCAVATING APPARATUS.**—Philo W. Clark, Oblong, N. Y.—This invention has for its object to furnish an improved excavating apparatus designed for use in transferring the soil from the place of excavation, and loading it upon a cart, or throwing it upon an embankment.

**HOISTING APPARATUS.**—H. A. Schneekoth, N. Y. city.—This invention has for its object to so construct the hoisting apparatus, which is operated by men, that power may be applied to it by means of the lower extremities and not by the arms, as usually.

**LAP BOARDS.**—William F. Gammel, Elizabeth, N. J.—This invention has for its object to improve the construction of lap boards, so as to make them more convenient and effective in use.

**BOILER FURNACE.**—J. A. T. Overend, San Francisco, Ca.—This invention consists in the application to the furnaces of metallic fire-backs and bridge walls, arranged for ready removal for the substitution of others, when worn out, and, in a manner, calculated to resist the heat to the best advantage, and to provide an air chamber behind the bridge wall to facilitate the combustion of the gases.

**ORE SEPARATOR.**—T. Bates, Pinos Altos, New Mexico.—The object of this invention is to provide a simple and efficient arrangement of means for receiving the tailings of gold, and other ores, from the battery, pulverizing, burning, and separating the same. The invention comprises an arrangement of grinding mills and amalgamating apparatus together, and with a battery.

**WASHING MACHINE.**—Wm. Baeger, Hastings-on-the-Hudson, N. Y.—This invention relates to improvements in washing machines, and consists in a simple and inexpensive attachment to ordinary wash tubs, for converting them into washing machines, with oscillating beaters, the same being suspended on a cover arranged for detachable connection to the tub by means of keys wedging into the holes of the handles, and dumping the cover down on the top of the tub.

**STUMP PUPPER.**—J. M. Eason, Charleston, S. C.—This invention relates to improvements in machinery for pulling stumps, and consists in suspending the chain hook from any suitable portable frame, by two pairs of arms, toggle-jointed to nuts, on a right-and-left-threaded horizontal screw, which is provided with a hand lever ratchet and pawl at the center for applying the power for raising the stumps by screwing the nuts away from each other, and with short levers at one end for turning it rapidly to force the nuts together to let the weight or chain hook down.

**NURSING BOTTLE.**—Edward Jones Mallett, Jr., and Wm. S. Ward, New York city.—This invention relates to improvements in nursing bottles and other vessels, for containing liquids, and from which they are to be drawn through faucets, cocks, or bungs, and it consists in a novel arrangement of automatic vent valves, in connection with the bungs or plugs, by suspending the valve by a spring secured in the vent passage, or at the top of the plug, and extending through to the lower side, and holding the valve up against a flexible seat of India-rubber, or other like substance.

**HUB-BORING AND BOX-SETTING MACHINE.**—Abraham Troup, Louisberry, Pa.—This invention consists of a pair of clamps for embracing the sides of a hub provided with feet for resting on the top of the same; and combined with an instrument for boring a recess in the end of the hub suitable to receive a box, in such manner that said instrument may be accurately adjusted to the center of any hub.

**TOBACCO ROLLER.**—C. A. Jackson, Petersburg, Va.—This invention consists of a wheel, whose rim is provided with any desired number of circumferential flanges, said wheel working in connection with a belt, whose inner surface is furnished with an equal number of longitudinal grooves into which the tobacco is pressed by the flanges of the wheel; these two devices being combined with scrapers that take the strips of tobacco out of the grooves in the belt, and also with a knife, operated by the wheel, that cuts the strips into plugs.

**CORN PLANTER.**—James W. Magers, Reinersville, Ohio.—This invention consists of divers improvements in the corn planter, all tending either to simplify its construction or render it more efficient in operation.

**ATTACHING POLE OR SHAFTS TO WHEELED VEHICLES.**—James McMillin, Ripley, Ohio.—This invention has for its object to enable the occupant of a carriage to detach the pole or shafts when the horses become unmanageable, and thus allow the animals to go on their way dragging the pole with them, and leave the carriage in safety.

**CAR COUPLER.**—John Coleman, Lynchburgh, Va.—This invention consists in the combination, with a bumper open at the sides of a hinged detent arranged within the bumper, so as to allow the head of the coupling bar to pass under it, and then to fall by its own weight upon the body of the bar and retain it, and of a coupling link having bevelled heads which pass easily under the detents, against the inner sides of which heads the free ends of the detents bear, which inner sides of the heads are rounded off at the corners so as to allow them to slip out at the open sides of the bumpers and uncouple when one car runs off the track so as not to draw the next car off; the coupling being automatic, and universal in its application.

**PAPER WEIGHT.**—Max Patzauer, New York city.—This invention relates to a new paper weight, which is so constructed that it can be used as an insect catcher or paper file.

**MACHINE FOR COVERING WIRE.**—A. Giraudat, New York city.—This invention relates to a novel spool carrier and holder attachment to a machine for covering wire with cotton, silk, or other thread. The object of the invention is to so construct the apparatus that the spool can be readily removed and put on, and that the thread will be applied to the gummed wire and pressed to firmly adhere to the same.

**FRUIT BASKET.**—Lauren Carpenter, St. Joseph, Mich.—This invention has for its object to so construct fruit baskets, that the same will be strong and simple and that they can be placed one upon another without injuring their contents.

**CARVING KNIFE.**—Owen W. Taft, New York city.—This invention has for its object to so provide carving knives that they can be used to extract skewers from the meat. The invention consists in forming a hook or aperture on the blade of the knife, whereby a clamp for holding and withdrawing the skewer is obtained. The removal of skewers from meat is at present a process connected with considerable difficulty and annoyance, and although many instruments may be used, it is evident that only the carving knife is appropriate and handy for that purpose.

**SHOE LACE.**—Rufus Wright, Brooklyn, N. Y.—This invention relates to a new and useful improvement in mode of lacing or fastening and unfastening shoes, whereby that practice is greatly simplified, and much more expeditiously and perfectly performed than it has hitherto been, and the invention consists in an arrangement whereby the shoe is fastened around the instep or ankle by simply drawing upward the lacing, and is loosened by the same movement downwards toward the toe.