

**NEW INVENTIONS.**

Messrs. Horace Massicks, of the Oaks, and Walter Crooke, of Duddon Villa, Parish of Millom, County of Cumberland, England, have patented an improved hot blast stove for blast furnaces. The object of this invention is to form a stove in which the greatest heat will always be maintained at the center.

Mr. Elias Durlach, of Brooklyn, E. D., N. Y., has patented an improved toy stove, constructed with a body having points upon its upper and lower edges, and the bottom and top plates having slits to receive the points and allow them to be bent down or clinched upon the plates, so that the stove can be easily, quickly, and cheaply made.

An improved whiffletree hook has been patented by Mr. Edward P. Barrett, of Holden, Mo. This invention consists of a ferrule or binding iron to be placed upon the single-tree, said iron or ferrule being provided with an enlargement upon the side of the single-tree, which is made with a narrow open slot, communicating with a larger hole or opening through the enlargement, and of a cockeye or loop to be attached to the trace, which loop is flattened or reduced in size at one point, so as to readily pass through the slot, the other parts of the loop being made too large to pass through the slot.

**GREBES AND THEIR NESTS.**

Simply clothed birds need not envy the grebe its rich, satin-like plumage, for in consequence of its possession the poor grebe is hunted and slaughtered wherever it shows its face. The crested grebe was once fairly common in our own country; it now no longer ventures to appear, and only frequents solitary lakes in sparsely populated countries.

Our illustration is from a sketch supplied by an American correspondent, and shows one of their breeding places on a lonely lake. There they build their nests of any floating weeds and rubbish that they can collect, and moor it cleverly, with bits of sedge or long rank grass, to some water plant that grows from the bottom. It forms a little island home, and, as shown in the drawing, there are generally found numbers of these nests near together. Four and sometimes five eggs are laid, and when we learn that generally the water soaks up from the bottom, and that whenever absent the old birds always cover the eggs carefully with

damp, moist weeds, we are rather astonished to hear they ever hatch at all.

The young are very prettily striped and marked, and at once take to the water, in and under which both old and young seem more at home than in the air itself, and it is in this continual diving that the suitability of their highly-polished feathers is so beautifully manifested, as it enables them to glide with lightning-like speed under the water, and

the only hieroglyphics, or sign writings, that exist in our language.

These astronomical signs, like the numerals, are employed in every European language without change in their form.

Each nation reads them in the language of the text; the sign,  $\oplus$ , for example, would be called the "earth" in English, "la terre" in French, and "zemlya" in Russian.

The origin of these signs is not generally known, and is usually found only in the older astronomies. In Long's astronomy, published in 1764, is given the following account of the original forms of these symbols:

$\gamma$  is the caduceus, the snake-trimmed staff of Mercury;  $\psi$  is a mirror with a handle;  $\delta$  is a lance and shield;  $\zeta$  represents the first Greek letter in the name of Zeus or Jupiter;  $\eta$  is a sickle;  $\odot$  and  $\ominus$  are the disk of the sun and the moon's crescent.

The signs for the sun and moon are the most ancient. They may be seen in the Egyptian hieroglyphic writing, and in the second century, Clement, of Alexandria, used them. It is strange to find that the Chinese, also, in their oldest writings, more than forty centuries ago, used a circle to designate the sun and a crescent for the moon.

But the planetary symbols are much more modern; they were never used by the ancients, who always designated the planets by name. These signs did not appear until the cabalistic sciences were developed by the alchemists, who designated metals under the representation of planets, as every planet corresponded to some particular metal. Alexander Humboldt dates these signs from the tenth century.

The earth was not at first counted among the stars, and did not have any symbol until after the discoveries of Copernicus. The cross that surmounts the earth symbol,  $\oplus$ , shows its Christian origin, dating from the sixteenth century.

The remaining signs are those designating the late discovered planets, Uranus and Neptune. The first, discovered in 1781, by William Herschel, is occasionally represented in Germany by a circle surmounted by a vertical lance, but as this is apt to be confused with the symbol for Mars, the initial H of the name Herschel is generally used in a slightly modified form,  $\text{H}$ .

Neptune, discovered by Le Verrier in 1846, was at first represented by the initials L and V in a cipher, but the trident,  $\text{♆}$ , was soon substituted as more simple and convenient.

These are all the signs in general use for astronomical



**THE SYMBOLICAL SIGNS OF THE PLANETS.**

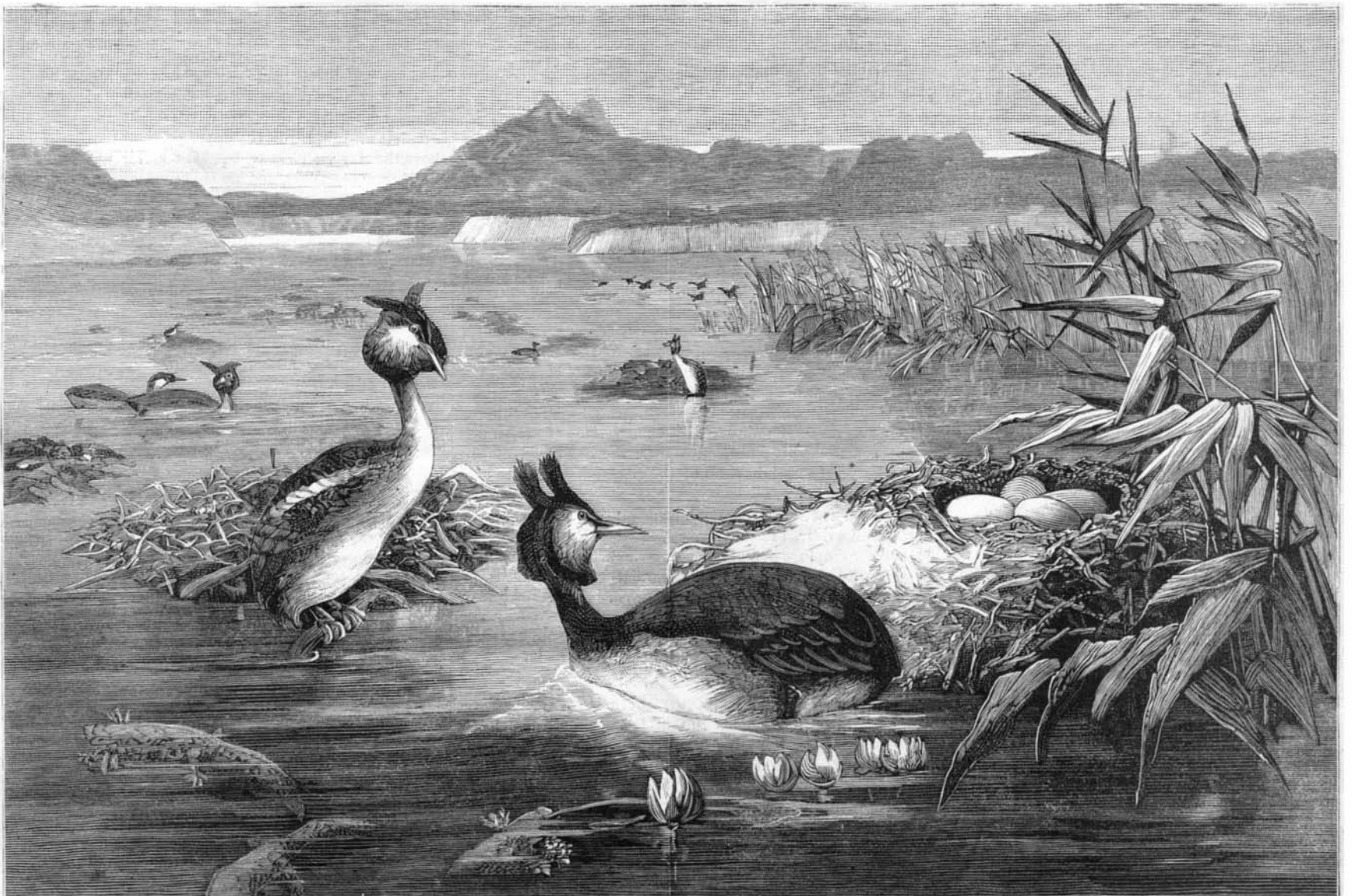
turn and double with amazing quickness. The feathers which are peculiarly valued are those which come from the breast of this particular bird.—*Graphic.*

**THE SYMBOLICAL SIGNS OF THE PLANETS.**

Any one who has studied astronomy will recognize the following symbolical signs by which it is customary to represent the principal members of the solar system:

- $\odot$  ..... Sun.
- $\ominus$  ..... Moon.
- $\gamma$  ..... Mercury.
- $\psi$  ..... Venus.
- $\oplus$  ..... Earth.
- $\delta$  ..... Mars.
- $\zeta$  ..... Jupiter.
- $\eta$  ..... Saturn.
- $\text{♁}$  ..... Uranus.
- $\text{♆}$  ..... Neptune.

It is to be noticed that these signs do not represent sounds, like the letters of the alphabet. They designate an actual object, and consequently with the numerals 1, 2, 3, etc., are



**GREBES AND THEIR NESTS.**

mechanics, as the asteroids are too numerous to be symbolically arranged. Any one desirous of pursuing the subject further can consult the works of Long, Lalande, or Von Humboldt, where they will find much curious and interesting information on this subject.—*La Nature*.

#### The Angora Goat.

Mr. Joseph P. Devine, a stock raiser in Texas, writes as follows to the National Association of Wool Manufacturers, Boston, Mass.:

There are millions of acres of rocky, hilly undergrowth of live oak in Western Texas and other States also, that will not support one sheep to twenty acres, one cow to forty acres, or one horse to fifty acres; in other words, that are utterly worthless for any use on God's green earth except for goats. Now if there is a good and sure sale for mohair, there is no doubt but the common goat can be made to produce, in five or six removes, a fleece equal nearly to any pure blood hair in luster and length, and in weight far more, by breeding from a pure bred billy every time and always. To sum up the advantages of goats over other stock, they can be herded with perfect safety and to advantage in flocks of 2,000; for I now have one herd of 2,050 graded Angoras, herded by one Mexican. They can be located in summer eight miles from their watering place, and drink once in three days, returning to camp same day—a great item in this dry country; they can be raised and thrive best on land worth fifteen to twenty-five cents per acre; they are subject to no disease whatever, that I know of; they will protect themselves, that is the grown, against wolves or dogs; and last, but not least, they come home five times in six, if lost on the range. Then there is not a more agreeable or pretty pursuit in the world than raising Angora goats. That you may not think I am too partial to Angoras, allow me to say I am breeding cattle, horses, and have 3,400 head of Merino ewes; and if I had a little more encouragement as to the future of the Angora, namely, regular sale and fair price for hair of first quality, I would, if forced to give up all my interest in stock except one, keep my pretty, intelligent, and valuable Angoras; and let sheep, hogs, etc., go to grass.

#### Trout Breeding.

Any person in possession of a spring producing a supply through the year of from one to one hundred square inches of pure water may grow, with right appurtenances and requisite knowledge and care, from 6,000 to 60,000 trout in one year, worth, at present prices for stocking ponds and streams, \$100 per 1,000, or 500 to 50,000 to weigh a pound each, worth \$1 per pound. The first thing necessary in trout culture is the construction of a pond, which must be fed by pure spring water, and must be kept clear and fresh. It is essential to the preservation of the trout that the temperature of the water be preserved at from 40° to 50°. The success attendant upon the culture of trout is instanced in the establishments of Seth Green, Livingston Stone, and other noted fish culturists, who realize large profits from this source.—*Sea World*.

#### Fires and Firemen in London.

The report of the Chief of the London Fire Brigade reports 2,376 calls for the year 1881. Of these 240 were false alarms, 145 proved to be only chimney alarms, and 1,991 were calls for fires, of which 157 resulted in serious damage and 1,824 in slight damage. The fires of 1881 compared with those of 1880 show an increase of 120, and compared with the average of the last ten years an increase of 351. The number of fires in the metropolis in which life was seriously endangered was 107, and the number in which life was lost 29. The number of persons seriously endangered by fire was 154, of whom 114 were saved and 40 lost their lives. The number of journeys made by the fire-engines of the fifty-three land stations was 28,441, and the total distance run 62,904 miles. The quantity of water used for extinguishing fires was 17,232,682 gallons, or about 76,931 tons. The strength of the brigade at present is as follows: 53 land fire-engine stations, 11 movable land stations, 121 fire-escape stations, 4 floating stations, 3 large land steam fire-engines, 35 small land steam fire-engines, 78 six-inch manual fire-engines, 37 under six-inch manual fire engines, 137 fire-escapes and long scaling ladders, 3 floating steam fire-engines, 2 steam-tugs, 4 barges, 29 hose-carts, 15 vans, 2 trollies, 53 telegraph lines, 7 telephone lines, 7 fire alarm circuits with 44 call points, 536 firemen, including chief officer, second officer, superintendents, and all ranks. The report states that the fire-alarm circuits have been of great service, though the men are often harassed by false alarms through them.

#### The Highest Railway Bridge in the World.

The Erie Railway extension from Bradford to Johnsonbury, Pa., crosses the deep valley of the Kinzua Creek about thirteen miles from Bradford. Here the company are building a bridge which, when completed, will be the highest railway bridge in the world. The bridge will be somewhat over 2,000 feet long, and will consist of twenty-three spans of 60 feet each, resting on piers of stone and iron. The greatest depth of the valley at the point of crossing is 300 feet. The piers will be 40 feet long and 110 feet wide at the base, tapering to a width of 12 feet at the top. The iron work will weigh 2,500 tons, and the masonry will measure

2,200 cubic yards. It is expected that the work will be completed by June, 1882, at a cost not far from \$300,000.

It is claimed that this is the highest bridge in the world resting on piers. The Kentucky River bridge is 276 feet high, the Great Peruvian Railway bridge is 235 feet, the Portage bridge, on the Erie's main line, is 234 feet, and the Niagara suspension bridge is 275 feet.

#### MISCELLANEOUS INVENTIONS.

Mr. George H. Beck, of New York city, has patented an improved apparatus for spreading varnish, paint, etc., in a uniform layer, for the purpose of facilitating applying the varnish or paint on the printing surface of the blocks used in printing hand-made wall papers. The invention consists in an endless belt or apron passing over suitable rollers and over a vertically adjustable cushion box, which is combined with mechanism for raising it when the machine stops, so that the wall paper printing blocks can be placed on this apron for the purpose of transferring some of the varnish spread on the apron by a spreading roller (dipping into a varnish box) upon this wall paper printing block.

Mr. Charles H. Henderson, of Philadelphia, Pa., has patented an improved waste water pail provided with a convex lid resting on a series of brackets projecting from the inner surface of the pail and united by a wire, this lid being so much smaller than the pail that an annular space will be formed between the edge of the lid and the inside of the pail; through this annular space the water flows and then runs down on the inside of the pail without dripping or splashing.

In hydraulic rams as ordinarily made it is difficult to adjust the valve screw with delicacy, and, furthermore, the constant pulsation or jar of the outlet valve tends to "back out" the screw, so that the tension of the spring is reduced and the effective working of the valve interfered with. Mr. Henry F. Morrow, of Chester, Pa., has patented an improvement in hydraulic rams which obviates this difficulty. In horizontal hydraulic rams of ordinary construction air accumulates in the air chamber until the water with difficulty gets access thereto, and consequently the ram labors in its work and does not operate effectively. To remedy this defect an open tube is introduced down through the top of the air chamber to a little below the water level therein. This tube serves as the water discharge pipe, as well as to prevent the excessive accumulation of air in the chamber.

An improved sash-fastening device, which can be easily applied to window sashes, has been patented by Mr. Silas G. Austin, of Boston, Mass. The construction of this fastener is such that it can be readily fixed to two light sashes opposite their center vertical dividing rails, in which position a sash fastener properly belongs to preserve the symmetrical appearance of the window; and instead of fixing a locking plate to the upper face of the meeting rail of the upper sash by small screws, which may be easily forced off, the construction of this fastener is such as to admit fastening it to the face of the meeting rail with such large and strongly holding screws that any attempt to force it off by prying up the lower sash would most likely demolish the glass in the sash and alarm the occupants of the house.

Mr. John F. Petri, of Midland Park, N. J., has patented a coupling by means of which wires can be joined more expeditiously and with less labor and expenditure of force than by the usual method of twisting them about each other. The invention consists in coupling the wires by means of a semi-cylindrical metallic plate having two radial holes to receive the bent ends of the wires. The wires, having their ends bent at right angles, are laid in the plate with their ends entered into the holes therein, and the said plate is then, by means of a hand vise or other suitable tool, clasped tightly about the wires, so as to form a closed sleeve about the point of union.

An improved combined hoe and cutter has been patented by Mr. Parrott M. Hardy, of Aurora, N. C. When the implement is to be used for cutting purposes the blade is to be detached from the end of the handle, which is easily done by simply partially removing a pin and sliding or tipping the blade forward and placing it upon the side of the handle; in this position pins projecting from the handle fit into the notches in the upright sides of the blade, and serve to hold the blade in place.

An improved safety attachment for elevators has been patented by Mr. Frank T. Ward, of New York city. This inventor employs a toothed eccentric held out of engagement with the rack, when in its normal position, but is released when the rope on the elevator car breaks.

#### The Explorer Leichhardt's Journals.

There seems to be no reason for doubting the reported discovery by Skuthorpe of the journals of the explorer Leichhardt, who lost his life in Eastern Australia many years ago. Baron Müller, of Melbourne, who for more than thirty years has been an ardent promoter of the search for the relics of Leichhardt's expedition, writes to Dr. Behm, at Gotha, that Skuthorpe probably continued Hume's routes until he successfully reached the most western stations in the interior of Eastern Australia. Here he found the journals of Leichhardt and Classen, and gained possession of them in return for a small present to the holders. Both journals are said to be in English and well preserved. Classen confirms the report of Hume's nine weeks' stay with

him, and records how the expedition suffered terribly from want of water. He was sent by Leichhardt in search of water, and on his return, two days later, he found Leichhardt dead. Afterwards Classen fell into the hands of the aborigines, who carefully watched him. Once he attempted flight, but was brought back and severely beaten. In 1877 Classen felt death approaching. He revisited the place where Leichhardt's journal, enveloped in leather, was hidden, and added to it part of his own journal.

#### Proposed New Patent Department.

To the Editor of the Scientific American:

The bill Mr. Phelps presented December 13, 1881, is calculated to supply a desideratum long felt and not disputed by those best qualified to form an opinion. It is substantially what has been recommended to the consideration of Congress by almost every succeeding Commissioner of Patents and repeatedly urged by you, and is, in brief, simply a permission to the one self-supporting bureau to extend its revenue on means, perfectly understood and defined, for the proper administration of its duties. One of the most important of these means is a completely indexed digest of industrial art. With such a repository at their disposal inventors (who constitute the principal contributors to the fund), would be able to concentrate their energies on untrodden fields of discovery, by informing themselves of what others had already accomplished. Manufacturers and users of machinery could at a glance, so to speak, inform themselves of the best appliances. The community at large, which is the chief beneficiary of invention, would in this simple act of justice be largely benefited by the increased discrimination exercised in patent grants.

G. H. KNIGHT.

Cincinnati, January 30, 1882.

#### Rapid Growth of New York.

The annual report of the City Inspector of Buildings shows that during the past year plans for 2,682 buildings, to cost \$43,391,300, were filed at the Building Bureau. In 1880 the number of new buildings erected was 2,252, at a cost of \$29,115,335. There were more buildings erected last year, and their estimated cost was greater than in any previous year.

Of last year's buildings, 940 were dwellings, whose estimated cost was \$12,521,500; 356 were flats, costing \$8,080,480; 808 were tenements, costing \$8,284,100; 8 were hotels, costing \$923,700; 123 were stores, costing \$3,643,500; 23 were to be used for office purposes, costing \$4,453,500; 116 were factories, costing \$1,723,935; 13 were places of amusement, costing \$1,196,300; 6 were churches, whose aggregate cost was \$216,000, and 6 were school houses, that were to cost \$217,000. One thousand four hundred and ninety-seven plans for alteration of existing buildings, at a cost of \$4,142,070, were filed. Two thousand two hundred and twenty-five buildings were found to be unsafe, and 2,229 were either pulled down for this cause or strengthened.

#### Self-Acting Fire Apparatus.

Prof. Obernien proposes the following ingenious and simple arrangement for theaters: Cords of hemp are stretched from left to right across the upper part of the entire space above the stage. They are fixed at one side, and on the other they pass over pulleys, and are kept tight by means of weights which are surrounded with cases. Perpendicularly under the weights, at the bottom of the cases, is a button, which, if pressed downward, closes the circuit of a powerful battery. If a flame rises up it catches and ruptures one of these threads, when the weight falls in the same moment upon the button and closes the battery. The results are: 1, a telegraphic message to the nearest station of the fire brigade; 2, a fireproof curtain is let down by a mechanism set in motion by a suitably arranged electro magnet; 3, an electro magnet opens a large ventilator in the roof above the stage for the escape of the flames and smoke; and 4, a reservoir is opened which lays the stage under water.—*Chemiker Zeitung*.

#### Tan Bark for Exportation.

The demand for tan bark in Europe is urgent, but the price is not sufficient to make the exportation of bark in bulk profitable. It is now proposed to grind and compress the bark where it is abundant, and ship it in kegs or half barrels. For this work a steamer has been built on the Ohio, to be used on the upper waters of the Tennessee River, along whose shores tan bark is plentiful and cheap. The steamer carries special machinery for grinding and compressing the bark.

#### The St. Lawrence Tunnel.

The railway tunnel under the St. Lawrence at Montreal, Canada, is to have the following dimensions: Entire length, about 21,700 feet; open cuttings on Hochelaga side, 2,500 feet, and on the Longueuil side, 4,220 feet; actual length of tunnel proper, 14,980 feet. It is to be 26 feet wide inside and 23 feet high. It will be lined with brick masonry throughout, except the fronts, which will have façades of stone. The arch will vary from 20 to 30 inches in thickness, according to the character of the ground to be supported.