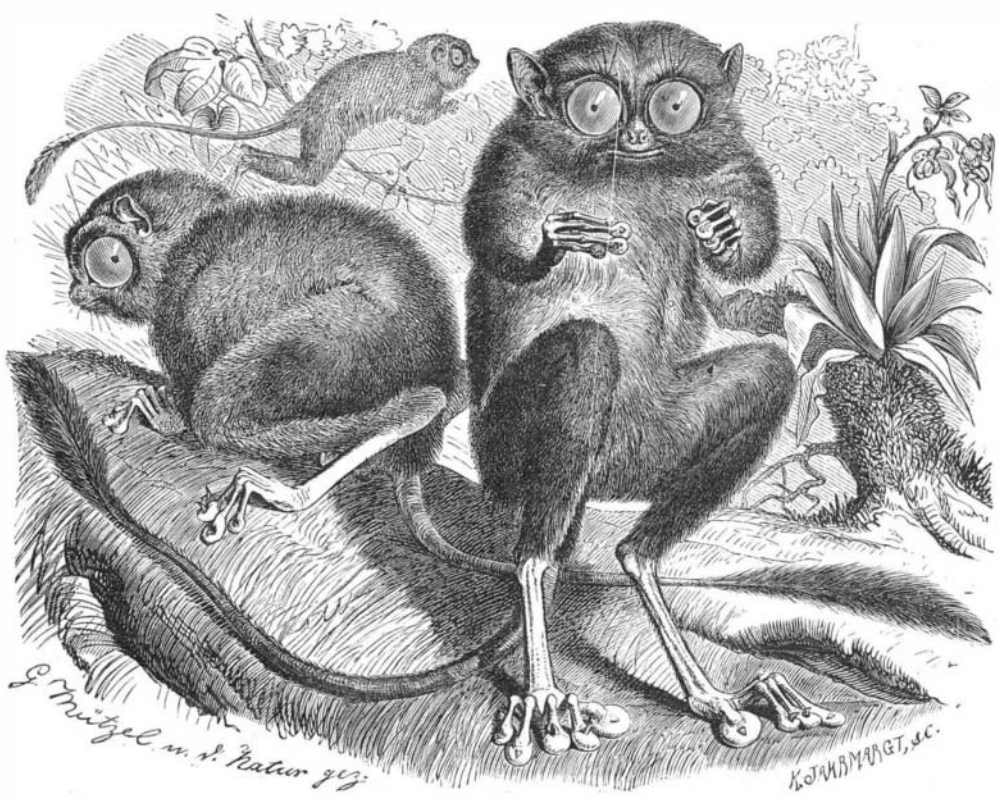
THE TARSIER.

This curious little creature is a native of Borneo, Celebes, the Philippine Islands, and Banca. From the latter locality it is sometimes called the Banca tarsier. It is also known as the podji. The color of the tarsier is a grayish brown, with a slight olive tint washed over the body. A stripe of deeper color surrounds the back of the head, and the face and forehead are of a warmer brown than the body and limbs. The hands are of extraordinary length in proportion to the size of the creature. This peculiarity is caused by a considerable elongation of the bones composing the "tarsus," or back of the hands and feet, and has earned for the animal the title of tarsier. The fingers and toes have at their extremities, upon their under surfaces, convex pads, and at the top short triangular nails or claws. Its eyes are of extraordinary size and very convex. It is a tree-inhabiting animal, and skips among the branches with little quick leaps that have been likened to the hopping of a frog.



TARSIER.—(*Tarsius Spectrum.*)

Fusing Metals without Fire.

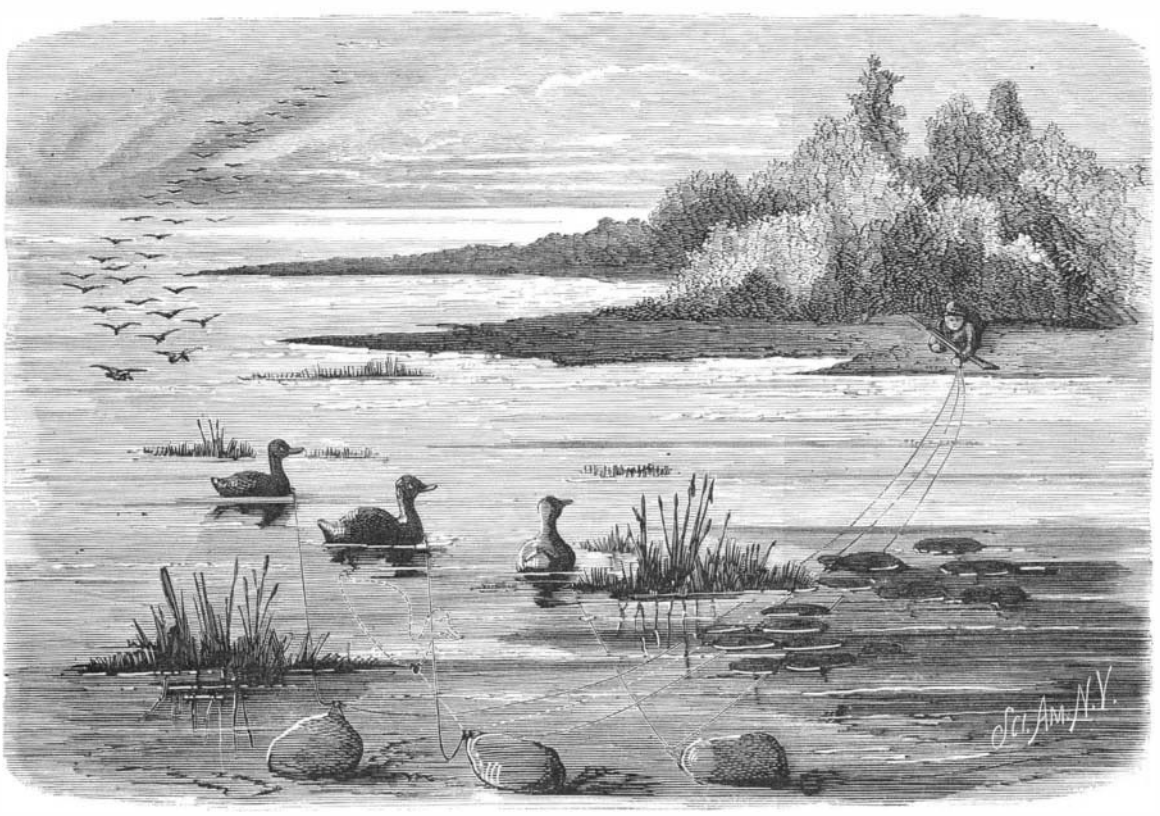
Jacob Reese, of Pittsburg, Pa., puts forth some remarkable claims in regard to an alleged new discovery in metallurgy. He says he is able to melt instantly a bar of cast steel one inch in diameter—which cannot be fused in less than five minutes in the highest furnace heat attainable—simply by throwing against it a column of air having a velocity of 25,000 feet a minute. The instant the air touches the metal fusion takes place. He says further:

"By furnace heat it requires many hours, and sometimes many days, to anneal metals. By a recent discovery which I have made, I can anneal bars of iron or steel at the rate of one foot per second, thus increasing the ductility of the metal 100 per cent, without the use of other fuel than that contained in the metal itself. I simply unlock the occluded (latent) heat. It becomes sensible and enlarges the metal, and by the method of doing this the enlargement is made permanent, that is, it does not contract to its original limit.

"Now, annealing and fusing iron and steel in one second of time may seem absurd, but it is nevertheless a fact, and reduced to practical utility in the arts."

DECOYS FOR WILD FOWL.

The annexed engraving represents a novel decoy for wild fowl, recently patented by Mr. Edmond Redmond, of Rochester, N. Y. The inventor applies a cord to the common decoy, and runs it through an eye or pulley attached to the sand filled bags in the bottom of the stream, thence to the shore, where the sportsman, by dexterously pulling the cords, causes the decoys to move and dive in the water like living birds. In running water, or where the wind prevails, the decoy may be allowed to move with the current or by the action of the wind, and may be drawn back by the cord.



REDMOND'S DECOY FOR WILD FOWL.

Some Ancient Monsters.

Recently Professor Cope, of Philadelphia, gave to the San Francisco Academy of Science a description of two lately discovered fossil animals. One was an enormous vertebrate, somewhat resembling an aquatic kangaroo, named the *Camarasaurus supremus*, whose neck was 9 feet in diameter, whose hind legs were 20 feet long, whose spinal vertebræ were 56 inches across, and which must have been 72 feet long by measurements carefully taken. This animal could walk in forty feet of water and catch its prey with its fore paws. He also described another similar monster whose spinal vertebræ were 6 feet across and whose hind legs were 40 feet long, with carnivorous teeth placed in the upper and lower jaws like shears, so as to cut up animal food by traversing each other in the most perfect manner. The bones of the lower half of this animal were solid and very heavy, to keep its feet down in the water, while bones in the upper half of its body were built in honeycombed layers as thick as pasteboard, strong, but very light and buoyant in water. This monster has been named *Amphicælias fragilissimus*, and must have been considerably over 100 feet in length. Both animals have large and powerful tails like kangaroos, and when catching their food in the water must have appeared as if on three-legged stools, the tail acting as an equal support of the tripod.

Bees Gathering Honey from the Catalpa.

At a recent meeting of the Philadelphia Academy of Natural Sciences, I called attention to the fact that there existed large patches of nectariferous glands on the under side of the leaves, in the axils of the veins, of *Catalpa bignonoides*. Up to the present time the proof that the glands in question were nectariferous rested only on the evidence of the taste of the secreted fluid and the presence of ants of both red and black species, apparently feasting upon the nectar. Since then I have found the common honey bee gathering the nectar from the foliar glands with as much industry as from the flowers, the latter of which at the time the observation was made having fallen, so that there was positive evidence that the glands alone attracted the bees. Furthermore, the bees were seen to introduce their tongues into the axils of the leaves where the secretion was present in a visible quantity on the gland, and lap it up as when getting the nectar from flowers. The bees engaged at this work carried no pollen at the time, and were apparently devoted to getting the honey only.

These observations place the question of the saccharine nature of the secretion beyond any doubt, and make it probable that the catalpa is valuable as a honey plant, and deserves a place in lawns, parks, and pleasure grounds, on account not only of its beauty, but also from its economic value to the bee culturist.—*John A. Ryder.*

SOME RECENT AMERICAN PATENTS.

An improved envelope has been patented by Mr. Solon P. Cady, of Peterborough, N. Y. It consists in an envelope having a short slit cut in its face in such position that when a stamp is placed on the envelope the slit will be adjacent to one edge of the stamp, whereby a proper tool may be inserted in the slit beneath the stamp and the contents of the envelope protected while the stamp is being punched.

An improvement in roasting ovens has been patented by Mr. Henry C. Atkinson, of Franklin, Ky. The object of this invention is to provide an oven to be placed on the outside of a stove or range, for cooking purposes. The oven is a removable one, and is to be set on the collar of a cooking stove or range.

An improvement in carboy trunnions has been patented by Mr. Samuel M. Holton, of Battle Creek, Mich. The object of this invention is to provide a device by which a carboy can be tipped and its contents poured out easily and without danger or inconvenience to the operator.

Mr. Jesse E. Nale, of Merchantville, N. J., has patented an improved pump, which is so constructed that the water contained in the pump barrel may be allowed to flow out, so that it cannot freeze in the barrel and injure the pump or prevent its working.

Mr. William Sias, of West Claremont, N. H., has invented an improved washing machine, in which the action is similar to hand washing; the dirt settles at the bottom, and will not be rubbed again in the clothes after being washed out.

An improvement in mowing machines has been patented by Mr. John H. Green, of Londonderry, Ohio. The object of this invention is to improve the construction of harvesters and mowers in such a way that, should the driver leave, fall, or be thrown from his seat, the cutters will be thrown out of gear and the cutter bar released, so that it will turn around parallel with the line of draught, if the machine should be drawn forward, to prevent the driver from being killed or injured should he fall in front of the cutter bar, and render the machine less liable to receive or inflict injury should the team run away.

Mr. George R. Huff, of Tomah, Wis., has patented an improved device for filing saws, which is so constructed that any one, even without practice or skill, will be able to file a saw true and accurate. The invention consists in a sliding block, having a longitudinal dovetailed groove in its lower side to receive the saw, and one straight and two inclined cross grooves in its upper side, for guiding the file and file holder.

Concerning the Memory.

The *Medical Press and Circular* gives some entertaining statistics of memory, from M. Delaunay. The inferior races of mankind, such as negroes, the Chinese, etc., have more memory than those of a higher type of civilization. Primitive races which were unacquainted with the art of writing had a wonderful memory, and were for ages in the habit of handing down from one generation to another hymns as voluminous as the Bible. Prompters and professors of declamation know that women have more memory than men. French women will learn a foreign language quicker than their husbands. Youths have more memory than adults. It is well developed in children, attains its maximum about the fourteenth or fifteenth year, and then decreases. Feeble individuals of a lymphatic temperament have more memory than the strong. Students who obtain the prize for memory and recitation chiefly belong to the former class. Parisian students have also less memory than those who come from the provinces. At the *Ecole Normale* and other schools the

pupils who have the best memory are not the most intelligent. The memory is more developed among the peasantry than among citizens, and among the clergy than among the laity. The memory remains intact in diseases of the left side of the brain, and is much affected in those of the right, from which it may be inferred that the right side is more the seat of this faculty than the left.

From a physiological point of view memory is diminished by over-feeding, by physical exercise, and by education, in this sense, that the illiterate have potentially more memory than those who know how to read and write. We remember, moreover, better in the morning than in the evening, in the summer than in the winter, and better in warm than in cold climates.

How Old is Glass?

The oldest specimen of pure glass bearing anything like a date, is a little moulded lion's head, bearing the name of an Egyptian king of the eleventh dynasty, in the Slade collection at the British Museum. That is to say, at a period which may be moderately placed as more than 2,000 years B.C., glass was not only made, but made with a skill which shows that the art was nothing new. The invention of glazing pottery with a film or varnish of glass is so old that among the fragments which bear inscriptions of the early Egyptian monarchy are beads, possibly of the first dynasty. Of later glass there are numerous examples, such as a bead found at Thebes, which has the name of Queen Hatasoo or Hashep, of the eighteenth dynasty. Of the same period, are vases and goblets and many fragments. It can not be doubted that the story preserved by Pliny, which assigns the credit of the invention to the Phœnicians, is so far true, that these adventurous merchants brought specimens to other countries from Egypt. Dr. Schliemann found disks of glass in the excavations at Mycenæ, though Homer does not mention it as a substance known to him. That the modern art of the glass blower was known long before is certain from representations among the pictures on the walls of a tomb at Beni Hassan, of the twelfth Egyptian dynasty; but a much older picture, which probably represented the same manufacture, is among the half-obliterated scenes in a chamber of the tomb of Thy, at Sakkara, and dates from the time of the fifth dynasty, a time so remote that it is not possible, in spite of the assiduous researches of many Egyptologers, to give it a date in years.

Impure Water—Toads and Squirrels in Wells.

The quantity and variety of filthy matter which is found deposited at the bottom of wells, in some localities, are astonishing. We recently had occasion to examine the *débris* taken from a well which had been cleaned the year previous, and among the accumulations were decaying toads and squirrels. These creatures had been probably attracted by the water, to reach which they had clambered down the wall till they reached the solid rock into which, for several feet, the well had been excavated, when they were precipitated to the bottom, and could not retrace their steps. To obviate a repetition of the same annoyance the stone wall has been removed down to the solid rock, relaid in hydraulic cement, and carried some three feet above the surface of the ground and finished for some distance around the top with cement underlaid with stones. On this solid foundation a curb has been so closely fitted as to exclude even crickets and grasshoppers, which are so apt to find their way into wells.

To those who detest impure water and would avoid perhaps the sickness of an entire family, the above plan, or the adoption of some better precaution against the contamination of wells, is recommended. This is the season when springs and wells are usually low of water, and therefore it is the best time for cleaning the bottom of the latter and repairing the walls if found defective.

Medicated Ice.

Dr. Edwyn Andrew, of Shrewsbury, England, has pointed out the advantages in certain surgical and medical cases of employing medicated ice. He thought the cold was rendered more effective by being combined with the active principles of drugs, and by freezing various medical solutions. In that manner ice might be rendered highly antiseptic, caustic, or styptic. In medical cases, especially of the throat, stomach, and hemorrhages from internal organs, ice might be thus pleasantly used to relieve symptoms and at the same time convey medicine as food to the stomach when the latter would resist them in any other way.

The Lotus in New York.

At the recent exhibition of the New York Horticultural Society, Mr. E. D. Sturtevant, of Bordentown, N. J., exhibited three water lilies, which promise to have great practical value for decorating grounds where there are small lakes. One of the plants was a true Nilotic Lotus, with circular leaves standing above the water, similar in appearance to those of our native *Nelumbium luteum*, and showing large nodding flowers. There were also some cut flowers of the *Nymphæa dentata*, a large flower of purest white—an enlarged copy of our own white water lily, *N. adorata*. Another was a blue variety, and most striking of all was a hybrid from two Indian varieties. The large heart-shaped leaves of this plant floated on the surface of the water, while the flowers were of a delicate pink shade. Mr. Sturtevant declared that these flowers, as well as those of the *N. dentata*, were fully twelve inches in diameter during the warm summer weather. These plants were all grown in the open air.

Concert Rooms.

Mr. Cecil J. Saunders, in a paper read at a late session of the Musical Association, in England, on the Construction of Buildings considered in Reference to Sound, made some very interesting statements and advanced some curious theories. Glass being one of the most elastic of sound reflectors, he was not surprised to find, when listening to a concert at the Crystal Palace, that the echo of one note returned to him at the same instant that he received the next note direct. He said that light had a remarkable modifying influence on sound, a statement which was corroborated by gentlemen who took part in the discussion that followed the reading of the paper, although the general opinion seemed to be that the cause lay not in the light itself but in the heat produced by it. Mr. Saunders then described the hall that he would have built to contain five thousand auditors. It would be a square room with rounded corners, and the orchestra in one of the corners. The audience would face the orchestra, and would thus look toward the converging walls. The number of performers provided for would be 700, as this was probably the limit of really good work, the orchestra seats rising tier above tier into the angle of the building. The organ should be chiefly below the orchestra, so as to allow of a low ceiling. By placing the orchestra in the angle of the building, very few of the audience can receive an echoed sound, The seats for the audience should be circular, so as to give every one a direct view. The floor should rise gradually toward the back of the room. The best material for the ceiling is wood. Ordinary plastering is one of the most perfect non-conductors of sound used in building. Zinc would be nearly as cheap, and perhaps even more efficacious than wood. The walls at the back of the orchestra should be covered with looking glass, which has a strong reflecting power for sound. These glasses, however, should not be bedded in flannel as usual, but allowed to vibrate with every note. Boarding or cement would be best for the rest of the walls. Cement is hardly resonant, but it reflects sound well. Stone would do better, but its cost is too great. No doubt a good deal of the resonance of cathedrals is due to the surface of smooth and hard stone inside them For quartet performances, a movable screen behind the players or singers might be arranged so as to re-enforce the sound in its forward direction. This screen should be of two thicknesses of wood, with a sounding-board at the top inclined slightly upward. Empty and half-empty rooms always echo, so that the best way of avoiding an echo is by low prices and a good programme. When there is a certainty of a small audience in a large hall, heavy curtains should be hung from the ceiling, so as to reduce its size.

Luminous Powders.

Two patents have been recently taken out in England for phosphorescent powders. One of the patentees states, in his specification, that his object is to obtain and utilize at night-time the light absorbed during the daytime from sunlight or an artificial light, either by employing the powders after exposure, or by augmenting their brilliancy by means of electricity. The powders are made by taking 100 parts by weight of carbonate of lime, and phosphate of lime produced by the calcination of sea shells; secondly, 100 parts of lime rendered chemically pure by calcination, and after the above are mixed, 25 parts of calcined sea salt are added, then 25 to 50 per cent of the whole mass of sulphur incorporated therewith by sublimation, 3 to 7 per cent of coloring matter in a powdered form composed of mono-sulphuret of calcium, barium, strontium, uranium, magnesium, aluminum, or other minerals or substances, producing the same appearances, *i.e.*, which become luminous in the dark.

The other patentee says of his phosphorescent substance, that he prefers calcined oyster shells combined with sulphur by exposure to sufficient heat, or a paste formed of neutral arseniate of haryta and gum tragacanth or sulphide of strontia, or sulphide of barium in combination with a small percentage of magnesia. For rendering walls or surfaces for advertising or other purposes luminous in the dark, they are coated with an adhesive substance. The phosphorescent substance is then spread over the surface, and then coated with transparent varnish or other transparent substance.

Coal Mining in Pennsylvania.

The total amount of anthracite mined in Pennsylvania during the coal year, ending Sept. 6th, was 17,123,275 tons, an increase of 6,601,043 tons over the product of the previous year. The bituminous coal mined was 2,372,568 tons, an increase of 156,073 tons. The total coal product for the year was 19,495,843 tons, against 12,738,727 tons for the coal year 1878.

An Incident of the Times.

From every part of our country prosperity seems to abound in almost every department of trade, and the demand for all kinds of machinery and implements, and the steam appliances for driving and making them, seems to be greater than for a long time past. The answer of one of our regular advertising patrons to our inquiry if his goods were in demand nowadays, is no doubt what most other manufacturers who advertise their goods experience.

All last year, says the gentleman, parties would write to know how low a machine could be furnished, and then, before ordering, they would write several times to get better terms. Now, says the manufacturer, things are different. Orders flow in faster than can be filled, and the inquiry is no longer how low the goods can be furnished, but how quickly.

Curiosities of Fires.

At the recent meeting of the National Association of Fire Engineers, Mr. M. Bennett, Jr., delivered a very interesting address, from which we take the following:

Of the 50 per cent of fires, more or less, not accounted for by incendiary origin, many undoubtedly originate from not yet understood causes. New hazards, from new or old processes, are daily developed, and some most curious facts in this connection have come within the range of my own personal observation.

Some months ago, in passing a prominent picture store in the city in which I reside, on a Sunday, my attention was attracted by the actions of a boy, which seemed to betoken lunacy He would stand with his back against the large show window outside for a few minutes, then turn about and carefully gaze within; then again plant his back against the window Curious to solve what seemed to be a case of idiocy in a bright looking boy, I asked the cause of his strange actions. Directing my attention, I discovered that the rays of the sun through the glass formed a focus in the middle of a large and valuable chromo, which just commenced to smoke at this identical point, and would evidently soon be in flames. The boy stated that he was a clerk in the store, but had not his key, and discovering the state of things, he planted himself as a patent living fire screen to protect the picture from the sun's rays.

A well-known Hartford adjuster, while recently sitting in his room in one of our finest business blocks, saw his silk umbrella, standing in the corner, quietly take fire and consume before his very eyes, and with no little difficulty he stopped the fire from spreading Investigation proved it to have caught from the concentrated rays of the sun reflected from his graphoscope innocently resting on his table. Without a doubt, we do not understand many actual causes of fire, and numerous conflagrations are due to far different causes from those suspected or guessed at. In the case mentioned, had the fire occurred during the absence of the owner, and the block consumed, as it might easily have been, it would have remained one of those unsolved mysteries which surround so many fires.

Animals also have played a most important part in the world's history. Romulus was the founder of Rome, but a wolf was the finder of Romulus. Rats saved New York (so the legend goes), geese saved Rome; but the cow Chicagoed all of us. The lion has been called the king of beasts, and the elephant the largest, but in our mutual profession the cow has played the chiefest role. Alas that the cow was ever invented, or, if invented, should have attempted, like many another calf, to have kindled fire with kerosene. If the cow had been kept out of the ark we would willingly have risked small pox and cheerfully accepted some substitute for milk as an eleven o'clock beverage; and really, with so much fresh water about, we see no reason for Noah's taking her in. The fiddler also played *his* part, for history informs us that Nero fiddled while Rome burned. What tune, we regret to note, has not been handed down, for it would be a most appropriate selection for the bands at our firemen's tournaments. A long one it must have been, as Rome burned seven days.

But why is it that, in spite of all the wonderful inventions and marvelous increase in fire extinguishing facilities, and in the skill, exactness, and military precision of our fire departments, losses by fire show such an alarming increase? Because the moral and physical hazard, the former influenced by the most outrageous and prejudiced legislation, and the latter by diabolical inventions, based on man's cupidity, have not only kept pace, but caught up and passed that vantage point which man's inventive and executive genius had reached.

When our grandmothers used to go to church with their footstoves and freeze one foot solid while warming the other, or sit with a hot brick in their laps, so intent on the sermon that they did not notice that their clothes were on fire until it had burned through to the skin, such a thing as a church burning from a defective flue was unknown The old-fashioned tallow dip, when the only fire extinguisher known was a mammoth pair of snuffers, reminding one of a mouse trap on a pair of scissors, did not explode, while the fireplaces were so large that the most explosive qualities of the biggest black log failed to force a cinder beyond the hearth stone. Neither did whale oil, by the light of which our grandmothers used to let down the stitches in their knitting work, and which was the only medicine known in the house to cram down the throats of defenseless children as a bowel regulator. Modern oil somewhat differs from the ancient, and is not of that kind told in the story of the lamp which was supposed to have burned above 1550 years in the sepulcher of Tullia, the daughter of Cicero; for fifteen minutes would be a fair average for a modern kerosene lamp to kill a servant girl and burn up the house. What would our ancestors have said, who bought oil by the pint—and scarce at that—to have seen a modern oil well in Pennsylvania, pouring right from the middle of the earth, unaided by human hands, a stream of this most inflammable compound the size of a man's arm, with a force as though a dozen fire engines were at the other end of it, at the rate of 80,000 gallons per day? More oil in a fortnight than was captured in an entire year by the whole whaling fleet of 600 vessels which sailed from the chief New England whaling ports in the palmier days of whale fishery, while to-day a gallon of sperm oil is as scarce as an old-fashioned whalebone umbrella. The depths of the ocean have succumbed to the depths of the earth.

For the fifteen years ending in 1875 the State of Pennsyl-

vania alone produced more than 300,000,000 gallons of oil. What would our good New Bedford grandmothers, who looked on 500 barrels as a very good catch, have said to this? With oil at 65 cents a barrel, who cannot afford to burn up?

The success of kerosene is one of the greatest misfortunes for those who have to put out the fires and for those who have to pay for them. But so long as a common kerosene lamp gives as much light as two dozen of the candles of our ancestors, and a gallon of oil at 25 cents gives as much light as 20 pounds of sperm candles, so long we must suffer. The adulteration of kerosene is, next to intentional incendiarism, the most alarming and rapidly-spreading cause of fire, to the suppression of which we ask your strongest influence and assistance.

But how can it be suppressed?

Only by legislation. Here again each of our individual votes will go as far as the wealthiest adulterator's. The apathy of the public on this point is beyond comprehension, and legislation fearfully inadequate to protect life and property against this terrible risk. It should be made a State prison offense to make, mix, or sell any product of petroleum as an illuminating oil that will not bear the standard of at least 120° Fahr., and recent State legislation of the so-called fusel oil or benzine, that the seller shall pay all damages caused by the men who drink it, can well be applied to the manufacturers and venders of this most villainous and certain incendiary.

So, also, the manufacturer of vapor and naphtha stoves, and so-called safety lamps, sold by agents who go about the country deceiving their dupes by experiments, the principal and most convincing of which to the uninitiated is to stick a lighted match into a saucer of the fluid. The innocent victim is naturally ignorant of the fact that none of the petroleum products are explosive *per se*, and that a certain ratio of air to the vapor is necessary to produce an explosion—the maximum degree of violence resulting from eight or nine parts of air to one of vapor; but while great skill is required to make the proper combination to produce an explosion, accident frequently fills the place of skill with the highest success. It is astonishing to note the applications in the Patent Office on ridiculous, ineffectual, and pretended processes for manufacturing naphtha and benzine, merely to deceive the public under false names, called by a most expensive and wicked satire *non-explosives*. One inventor actually obtained a patent for a non-explosive oil, made by adding 20 pounds of potatoes to 40 gallons of naphtha and a few other ingredients, which might have been good for potato bugs, but much better for fire bugs.

It has been hinted that underwriters were not business-wise interested in too great proficiency in the fire department, on the ground, we suppose, that fires are necessary to keep the business good. But absolute perfection, like perpetual motion, is against nature's laws, as at present developed, and, gentlemen, we say, don't spare *us*. Make your departments as near perfect as possible. Prevent if you can; but if fire occurs, put it out as quickly as possible, and we will take the consequences of the injury to *our* business. Do not stop on *our* account. However successful you may be, reach perfection so absolute that fire loss is an unknown quantity. We will trust the memories of Troy, Portland, Chicago, and Boston to keep our business good, long enough, at least, to accumulate a sufficiently large surplus to retire upon.

We used to read, with some pity for their ignorance and lack of civilization, of the Indians when, in wonder lost, they first saw the iron horse snorting through their prairie homes. But what would our even now living ancestors have said in their earlier manhood, when the only fire department was the old-fashioned well in the back yard and a couple of leather buckets in the front hall, or even the later improvement, the old hand engine, with its long arm and a "break her down, boys, aye, break her down, backs and all," to have witnessed instantaneously with the first warning cry of fire from the tongue of the old church bell, the doors of a large building spring open as if by magic, and an immense iron structure on wheels rush out and through the streets, pell mell, puffing, screeching, and snorting, up and down hill, around corners and angles, with the highest speed and accuracy; no horses, no men pulling or pushing, and as soon as they reach the fire half-a-dozen enormous streams instantaneously pouring over the building, until the only fear was from flood, not flame? Methinks the wonderment of the Red Man would have sunk into an eclipse. But letting alone the astonishment your present system, with its wonderful perfection and military precision, would have had on our *forefathers;* only last fall, at a meeting of the Northwestern Association at Chicago, a party of us, ladies and gentlemen, went over to witness an exhibition kindly tendered us by your chief. Among our party was a lady who had traveled over the world, and who had been told beforehand of the wondrous proficiency of its workings, and had every reason to know exactly what to expect. We first called on the fire patrol. As she stood at the head of the stairs, that she might the better see it, the alarm struck. Instantaneously down came the steam whip upon the backs of the equally expectant horses, who, trained and impetuous, jumped from their places before the lash could reach them. Forth leaped with the loud clatter of eager hoofs three elegant specimens of horsehood; the doors of the house opened wide, and a trap door flew up for the exit of the awakened firemen. Themen jumped from their beds into their boots, while the bedclothes from every bed in the room, attached with hooks at the bottom, flew upward to the wall in one grand pile, with a lightning like precision which would have done credit to a hangman of the last convicted incendiary. All instantaneously in one grand crash and jump, the men dressed, were seated on the wagon, the horses harnessed and out of the building ready for action. But our lady of travel was so amazed and dazed at all this concentration of skill and ingenuity that she lost both her head and her balance, and tumbled down the whole length of the stairs, while the gallant captain, who had gone through all this and was seated on his wagon in full uniform, had time enough left to jump off and catch her as she reached the bottom. It was said, with a complimentary humor dry enough to produce spontaneous combustion, by a member of that association, in reply to an invitation to visit the engine house in the evening and see the workings of the alarm system, he moved that the visit be made in the daytime, as the last time he went in the evening the steamer got out so quick he couldn't see it. David was evidently no fireman when he wrote in the 39th Psalm, "While I was musing the fire burned," for no fireman ever stopped to muse while a fire was burning.

Ore Smelting at Leadville.

There are now thirteen smelting establishments with twenty-eight furnaces in operation in the Leadville district, a number of them being on Fryer Hill, close by the great mines. The ores are easily smelted and undergo the simplest processes. Some of the ore needs crushing, and it frequently happens that low grade ores are in demand, the lead being needed for fluxes. Sometimes the iron ore found in the mine is used for flux, and in many cases they have to run some of the slag through again to help. The smelting works are all fitted with the newest machinery. A correspondent of the *Herald,* writing from Leadville, says that they are doing well, but encounter a heavy expense from the high cost of coke, which is hauled in wagons from Trinidad, a distance of 200 miles. The needed charcoal is made here in the timbered mountains surrounding the camp.

The method of dealing in ore is simple and wonderfully correct. It is sent from the mine in wagons and dumped into separate bins at the smelting works, then put into a box, quartered, and assayed. It is then again quartered and crushed to a fine power. Half the sample is then given to the miners and the smelter keeps the other half. Each party has his assayer. If the assayers agree, as they nearly always do, the bargain is closed and the miner is paid at once by the assay. If the assayers disagree, then a third disinterested party comes in as an arbitrator. These ores are difficult to sample, and one or two smelters caught playing smart games have to pay more for their ore. The smelter pays New York price for silver said to be in the ore, less five per cent., and $20 smelting charges per ton, and he also pays from $15 to $20 per ton for the lead. The lead and silver are run together into bars of 100 pounds each, and shipped to New York or St. Louis as base bullion. There are numerous advantages in shipping the metals in this way. The freight is lower, the cost of getting bullion to New York being this way only about $25 per ton. There is not much danger of loss by thieves, because thieves seldom steal a pig of lead, and they could not very easily get the metal separated. It goes to Newark, N. J., and is there separated. The value of the lead in the pigs at New York more than pays the cost of freight, separation, hauling, etc. In fact, it deposits the silver in New York free of costs and charges, and is still sold at a neat profit.

The Russian 32-Inch Objective.

A contract, it is said, has been made by Alvan Clark & Sons, of Cambridgeport, Mass., with the Russian government, relative to the great objective for the Imperial Observatory at Pulkowa, for a great telescopic objective. The proposed glass is to be the largest in the world. The contract provides that the definition of the glass shall not be inferior to that of the telescope in the Naval Observatory in Washington, and that the amount of light shall be greater in proportion to the increased area of the objective, allowance being made for the obsorption of light by the glass.

The objective at Washington is 26 inches in diameter; the proposed glass is to be from 31½ to 32 inches in diameter, with a clear aperture of thirty inches. Three years and a half are allowed for its completion—two years to procure the rough disks, and eighteen months for grinding, polishing, correcting, etc., with an extension of time, provided good and sufficient reasons are given for the failure to finish within the specified period. When finished the glass will be mounted in Hamburg. The cost of the glass alone will be $32,000. The material for the glasses will probably be furnished by French manufacturers, the Clarks finding their disks to be most trustworthy.

The cost of the objective is to be $32,000, with $1,000 additional for rough mounting.

Steam Launch of Light Draught.

In our SUPPLEMENT, No. 179, we gave the drawings and dimensions for a stern wheel steam launch (31 feet length) of light draught, 16 inches, as built at the United States Works, Rock Island, Ill., from designs by M. Meigs, United States Civil Engineer. We learn from Mr. Meigs that one of these little boats, in which he has lately made a trip, ran 8½ miles an hour on 110 lb. steam without crowding. He says the boat handles so wonderfully, turns so short, and runs in such shallow water he is confident that when light draught is needed no other construction is so good as the stern wheel.

AGRICULTURAL INVENTIONS.

An improvement in harrows, patented by Mr. Alfred Deisher, of Fleetwood, Pa., consists in making harrow teeth of plates with an inclined cutting edge, wings, a shoulder, and pin. By this construction the harrow is adapted for the additional work of a pulverizer and drill. It is of light draught. It is adapted for working soft or hard soils.

Messrs. L. H. and R. F. Johnson, of Brownsville, Tenn., have patented an improved corn and pea planter. This is an improvement in the class of seed-dropping machines which have reciprocating seed slides that are operated by the rotation of the transporting wheels, or the axle on which they are mounted.

An improvement in grain separators has been patented by Mr. Thaddeus C. Histed, of Junction City, Kan. The object of this invention is to improve the construction of the grain separator for which letters patent No. 199,204 were granted to the same inventor, January 15, 1878, so as to make it more effective in operation. As the grain is conveyed through a spout it passes between the two brushes, by the action of which all smut and dust are removed from the kernels and blown away by the blast from the fan blower.

An improved runner for corn planters has been patented by Mr. Gamaliel S. Rarey, of Groveport, O. The invention consists in providing the runners with V-shaped points, which connect with gauges attached to the runners on either side, and regulate the depth to which the runners extend, while the points throw the obstructions aside and level off the ground.

An improvement in grain binders for harvesters has been patented by Mr. Thomas H. Parvin, of Chicago, Ill. The object of this invention is to furnish an improved binder for binding grain as it is delivered to it from any harvester. The nature of the invention is such that it cannot be described without engravings.

Mr. Solon D. Rice, of Grant, Ky., has patented an improved machine for cutting corn stalks into pieces in the field. It consists of a roller carrying a number of radial knives, which press the stalks to the earth and at the same time cut them.

Mr. Francis C. Frost, of Anoka, Minn., has patented an improved hand corn planter, which is so constructed that the seed may be forced out of the dropping hole at the proper time, so that there can be no failure in dropping the seed. It may be adjusted to drop less or more seed at a time, as may be required.

Mr. Charles M. Sparks, of Earle's, Ky., has invented an improved churning machine, which is simple in construction, convenient, and apparently effective.

Mr. George B. Gay, or Opelousas, La., has patented an improved attachment for turn plows for scraping and sweeping cotton plants, "laying by" corn, and cultivating other plants.

Mr. Benjamin Goodyear, of Carlisle Pa., has patented an improved device for holding and preserving corn selected for seed, whereby it shall be kept safely from rats and mice, and at the same time have opportunity for becoming thoroughly dry. It consists in a board of suitable size fitted with projecting pins, and provided with a wire for being suspended. The ears of corn are placed on the pins. The space between them permits free circulation of air, and the safe, being suspended from a beam or similar support, is not accessible to rats and mice.

The Lay Torpedo.

The Buffalo *News* relates at some length the steps of Mr. Winsor in the torpedo business. The capabilities of the machine being conclusively ascertained, it was entered for the great tournament of torpedo boats at St. Petersburg, some eighteen months ago. The Russian government offered a prize of $50,000 and expenses paid for the best torpedo boat, which would comply with several minimum conditions of speed, ease and destructiveness. There were no less than forty-four torpedo boats entered, the inventors belonging to nearly every civilized nation, but the Lay boat bore off the prize. The Lay invention consists of a boat nineteen feet in length, thirty inches beam, and eighteen inches hold—a long cigar bearing on its point a cartridge containing 100 pounds of dynamite glycerine. Inside is the propelling machinery, equivalent to 35 horse power, being compressed air. Sideboards or planispheres at the side enable the boat to go under or on top of water at the will of the operator. The boat is raised, lowered, and steered by electricity, the medium being a cable of three wires attached to the stern and paid out as the boat rushes toward the marine victim. The operator stands on shore and directs the movements of the boat by a key-board with three keys, each communicating with one of the three wires. One steers the boat, the other raises or lowers it, and the third fires off the charge. A small flag in the middle of the boat indicates its position when on top of the water, and when the flag recedes from ordinary eyesight the operator traces its progress with a powerful glass. It was shown that the Lay boat could be sent out three miles, made to strike an object a foot square, and return to the point of departure at a speed of twelve miles an hour.

After the tournament, Winsor negotiated a contract with the Russian government to build twelve torpedo boats at $25,000 apiece, and also obtained similar contracts from China and Japan. The company is now negotiating with the English government, which offers the Lay company a big contract, if the invention is proved to be superior to the English torpedo boat.