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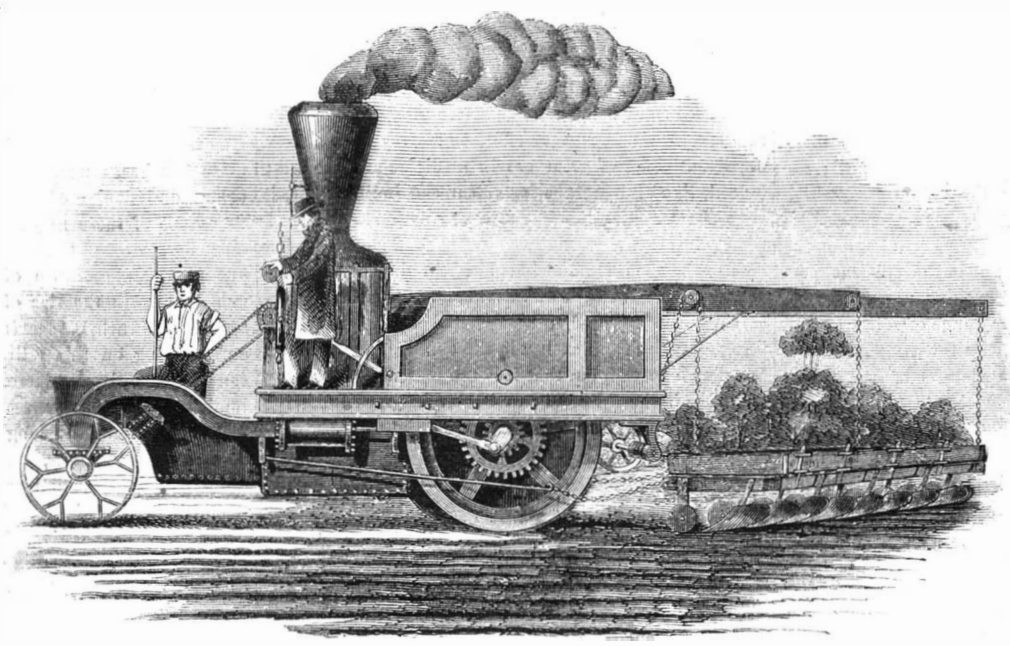
FAWKES' STEAM PLOW.

The time is quickly coming when a great revolution will take place in our modes of cultivating the soil, and steam is designed to make as great a revolution in agriculture as it has done in transportation and travel. From all the accounts that we have seen of the various trials of the steam plow invented by Joseph W. Fawkes, of Christiana, Pa., it seems likely to prove a great step in the right direction, and it has already done some very good work. We understand that it plows up and down hill with equal facility; the furrows are very deep and regular; it is perfectly manageable in turning, backing and the other requisites of a field-locomotive. Our illustration is a perspective view of one of these steam plows, with the shares above the ground. In outward appearance, it is a traction engine, with its front supported by two wheels, on whose axle is a segment, so that they can be turned by a screw, and so steered. This screw is operated by an endless chain passing around a pulley at its end, and around the axle of a steering wheel on the platform. The back part of the framing is supported by a drum of slightly bilge form, and the axle of this being connected by cranks and cog-gearing to the pistons of two horizontal high-pressure cylinders, it forms an efficient driver.

A shaft crosses the back part of the engine, provided with a ratchet at one end, into which a pawl catches. On this shaft, near its ends, are two pulleys, around which chains or ropes pass, and these chains are connected with others that pass over pulleys on the bars that project from the back of the engine, and support the oblique rhomboidal shaped frame that carries the plow frame.



FAWKES' CELEBRATED STEAM PLOW

The plows may be of any form, and they are attached to other frames in pairs. These frames are simply two iron bars placed at a suitable distance apart, and plows are firmly secured to each side of these frames in gangs, one plow being slightly in advance of the other, and turns a furrow slice which will be lapped by the one turned by the hindermost plow. Each of these plow-frames has a gage-wheel attached to its front end, and these wheels determine the depth of the furrow.

These plow-frames are attached to the frame suspended by chains or ropes by a bar in front, that passes through a slotted piece attached to the front of the suspended frame, and a wooden pin in the bar above the slot. The back part of each plow-frame has a curved bar connected with it, and this is attached to a slotted piece in the back of the suspended frame. All these parts are so adjusted that the plow-frames can be placed parallel with each other, and in line with the planes of their movement. Each plow-frame is connected to a bar on the engine by a chain. The shaft to which the chains of the suspended frame are attached is connected with the driving-wheel by a belt and a pulley on the axle of the driving-gearing that can be thrown in and out of gear from the platform of the engine, so that the plows can be raised out of the ground by the engine itself. A brake, also operated from the platform, is applied to a wheel on the end of the chain shaft.

The machine operates in the following manner: As the whole is propelled along, the plows turn the furrow slices in the ordinary way, any proper number of plows being used, according to the size and power of the machine. Each plow-frame is allowed an independent movement in the suspended frame, so that each can fall in passing over a depressed surface of the ground without affecting the other plows, and each frame may rise and carry with it the suspended frame for a certain distance without affecting the other plows. Every two plows, therefore, are allowed an independent adjustable movement to conform to the inequalities of the ground over which they pass. In case of either of the plows of a frame meeting with an obstruction, the wooden pin that connects its chain with the engine will break, and the wooden pin above the slot will also be broken, and the plow-frame will be detached from the suspending frame without in any way affecting the other plow-frames. By this method of attaching the plows, none of the parts of the machine can become strained or injured in consequence of either of the plows meeting with obstructions in its path.

When the whole gang of plows is to be raised from the earth, the belt-wheel on the shaft of the gearing is thrown in gear by the attendant, motion is given to the chain shaft, and the plows are elevated, the front end of the suspended frame being elevated first so that the plows will be placed on an angle and pass upward out of the ground when the suspended frame is raised bodily off the ground. The ratchet on the chain shaft prevents it from turning under the weight of the plows and their frames. When it is desired again to allow the plows to work, the frame is caused to descend gradually.

It will be seen, from this description, that the great objection to such machines, namely, the jarring and consequent disarrangement of the machinery by obstructions in the ground, is overcome, and the adjustability of all the parts is secured. We have, in recent numbers of the SCIENTIFIC AMERICAN, said so much upon the subject of steam-plowing and its advantages that we need not here reiterate our remarks. Mr. Fawkes has applied for a re-issue of his original Letters Patent, dated Jan. 26, 1858, and has also made application (through the Scientific American Patent Agency) for a new patent on improvements and novelties he has recently introduced into this excellent steam plow. He will be happy to give any information, upon being addressed as above. An arrangement has been effected with Mr. Fawkes for an exhibition of this plow in full operation during the Fair of the American Institute, which will be held in this city, commencing the last week of this month, and continuing throughout the month of October.

THE GOLD BELT OF THE ATLANTIC.—There is a belt of gold-bearing rocks which extend from Virginia, through North and South Carolina and Georgia, and then dips down under the coal fields of Alabama. Professor Darby, of Auburn, Ala., in a letter to the N. Y. *Evening Post*, states that this belt is of various widths, from a few to many miles. "It is of varying richness, and in most places will pay for working, and in other places yield rich returns. These rich deposits or veins are generally of a limited extent, so far as accessibility is concerned. From these main veins there are often branches that extend out of the gold be proper, and often form rich mines. The principle mines on the main belt are, commencing on the northeast part of Georgia, thence in the neighborhood of Dahlonega; and on the Chestater river, Nickelsville, the Lawhona or Sixes, are mines on the same belt, that have been extensively worked, and have made at times rich returns. The McConnell mine, recently sold to a New York company, is southwest from the above, and on the same belt. The Mahone and King mines are southwest from the above and on the same belt. The great Allatoony branch, in Cass county, Ga., runs through this property, from which millions of dollars were taken out from 1832 to the present time, and this branch and other branches running through this property now would yield fruitful work in getting what gold was left from the rude and imperfect working of former years."

FLIES *vs.* HORSES AND CATTLE.—It is a true saying that a merciful man will be merciful to his beast. Acting on this idea, a correspondent wants to know if some preventive cannot be employed for the protection of horses and cattle against the attacks of flies, thus enabling these animals to enjoy more quiet and peaceable lives. He says that flies will not touch onions or smart-weed, and thinks it possible that some wash might be made out of these, or some other article, to serve this humane purpose. There is a snug little fortune in this discovery.

A CHAPTER ON CANDLES.

It must be a very young man who does not remember that most noisome invention—the mold candle, accompanied by its still more noisome companion—a pair of snuffers; and yet how should we stare, if on the table of the most modest household they should again appear. Indeed, they seem as much a thing of another age as the flaring flambeau and its rude extinguisher, which may yet be seen suspended from the scrolled iron-work about the doors of old family mansions. This light of other days sprang directly out of the domestic grease-pot: its manufacture was a rude, not to say disgusting handicraft, and if any one had been bold enough to say that one day a new light would arise, that would materially affect the destinies of a whole people, Bedlam would have been thought his proper destination.

Noticing the other day the extraordinary piles of casks incumbering the wharf of Price & Co.'s Patent Candle Company, at Battersea, we could not help looking upon them as so many dumb missionaries, ever circulating between England and the Gold Coast of Africa, spreading civilization and religion over the latter hitherto benighted region. And the introduction of a new commodity for the supply of a common want, has again re-acted favorably on the labor of the particular trade to which it refers. Instead of the chandler's shop, where the simple process of melting refuse animal fat alone engaged the intelligence of the workmen, we saw in this establishment a vast laboratory, and in place of mere mechanics directing the works, a practiced chemist, availing himself of the last word of science and the best products of mechanical skill. Instead of the grease-pot or the beeswax cake comprising the whole repertory of the trade, the museum of the establishment sets before our eyes the products of a hundred climes, which may be ranked among the raw materials of the manufacture.

The animal, vegetable and mineral worlds are laid under contribution for the same end. The Shea butter —butter of Abyssinia—a vegetable product first mentioned by Bruce; petroleum of Ava, a mineral; the beautiful insect wax of China; the cotton pod, which yields the last new light of America; the hundred-and-one nuts of tropical climes; and even the fat of the tiger, may here be seen, proving that the efficient production of even so insignificant a thing as a candle necessitates a knowledge of a large range of sciences, and includes within its grasp not only the contents of the grease-pot, but the analogous products of the whole world. The process of manufacturing candles, as carried on at the works of Price's Patent Candle Company, which we propose briefly to describe, is one of the most interesting sights in London. The two establishments are known as Belmont, at Vauxhall, and Sherwood, at Battersea, and the huge corrugated iron roofs of each are doubtless well known to the reader who is in the habit of passing frequently up the river. The manufactory at Sherwood is by far the largest; indeed, at Belmont little more than the production of night-lights and the packing of the manufactured goods is proceeded with. At Sherwood the works cover 12 acres of ground, six of which are under cover; and to this establishment we wish to carry our reader. The raw materials principally used in this manufactory are palm oil, cocoa-nut oil, and petroleum; the first, however, is used in by far the largest quantities, and to its preparation for the manufacture of candles, we shall first draw your attention. Palm oil, as imported, is of a deep orange color, of the consistency of butter at midsummer; hence it will not flow out of the cask like the more fluent oils; and to assist this costive tendency—the first care of the manufacturer —the following plan is pursued: the casks of oil, as they arrive from the docks, are transferred to a large shed, the floor of which is traversed from end to end with an opening about a foot wide, which is in communication with an underground tank. Over this opening the bung-hole of each successive cask is brought, and the persuasive action of a jet of steam thrown into the mass speedily liquefies and transfers it to the underground tank. Herefrom the oil is pumped by steam-power to what may be called the high service of the establishment, gravitation being sufficient to make it carry itself to the distilling-rooms. Palm oil and all animal oils are made up of three elements—a very hard body, called stearic acid, a liquid termed oelic acid, and a white sirupy body, which acts as a base to the other two. Now, these three companions agree admirably in nature, but the moment art attempts to convert them to her own purposes in the formation of candles, a little difficulty arises—the glycerine turns out to be the slow man of the party; like many good men and true, its illuminating power is found to be greatly deficient to that of the company it is in, and hence its ejection is voted by the scientific candle-maker. Not long since this was performed by the process termed lime saponification. By this method cream of lime was intimately mixed with the fatty matter to be acted upon, and the principle of chemical affinities coming into play, the different ingredients, like the dancers in a certain coquettish waltz, forsook each other for new comers: thus the stearic and the oleic acids waltzed off with the lime, leaving the glycerine by itself, dissolved in tears—the resultant water. No sooner, however, was this arrangement completed, than it was broken up by the introduction of strong sulphuric acid, which, in its turn, waltzed away with the lime, leaving the fat acids free. This was an expensive process, however, inasmuch as, independently of the cost of the lime and sulphuric acid, the stearic acid obtained was comparatively small in quantity, and the whole of the glycerine was wasted. The next step in the process is known as the sulphuric acid saponification, the fat acids being exposed to sulphuric acid at a temperature of 350° Fahr. By this process the glycerine is decomposed. The fats are changed into a dark, hard, pitchy mass, the result of the charring of the glycerine and coloring matters—its final purification being effected in a still, from which the air is excluded by the pressure of super-heated steam. In 1854, this process was brought to its present perfect state by passing this super-heated steam directly into the neutral fat, by which means it was resolved into glycerine and fat acids, the glycerine distilling over in company but no longer combined with them. This was an immense step gained, inasmuch as the glycerine, thus for the first time obtained pure, and in large quantities, was raised from being a mere refuse product, which the candle-maker made every effort to destroy, into a most important body, of great use in medicine and the arts; indeed, like gutta-percha, or vulcanized india-rubber, it is no doubt destined to play a great part in the affairs of the world, and is far more valuable than its companion bodies, the stearic and oleic acids. In the chemical laboratory little episodes of this kind are continually occurring—the rejected, despised, and unknown refuse, being often led forth at last as the Cinderella of science. We may here mention that it is the presence of this very glycerine in the old mold candle, and in the still existing "dip," which produces the insufferable smell of the candle-snuff. A candle when blown out, exposes the smoldering wick to the action of the atmosphere, and the glycerine distils away in the smoke. Yet here we see as much as six tuns distilling at one time in one room without the slightest smell, in consequence of the process taking place in a vacuum. Imagine, good reader, what would be your sensations sniffing at six tuns of the concentrated essence of candle-snuff!

The two acids, the hard stearic and the fluent oleic, have still to be separated, as it is only the former which is, from its high melting point, calculated to form the true candle material. The cooled fats, forming a thick lard-like substance, having been cut in appropriate slices by means of a revolving cutter, are then by an ingenious labor-saving apparatus spread upon the surfaces of cocoa-nut mats, which are taken away in trucks to the press-room. As these pass in huge piles before you, the imagination may picture a tea-party of Brobdingnagians, and these are the countless rounds of brown bread and butter provided for the occasion. In the press-room these piles are subjected to hydraulic pressure, which slowly squeezes out the oleic acid, leaving the stearic acid behind, in the form of thin, hard, white cakes. These are re-melted in a huge apartment filled with deep wooden vats, appropriate cups for the monstrous bread and butter before mentioned. The arrangement by which the melting process is carried on is novel in the extreme. Into each vat a long coil of pipe depends, which admits into the fatty mass a hissing tongue of steam, which quickly liquefies it. The use of metal boilers is precluded by the fact that, on account of the acid oil to be acted upon, silver, as in the manufacture of pickles, would be the cheapest that could be employed.

The stearic oil, or candle-making material, of the cocoa-nut is extracted simply by pressure, no distillation or acidification being required. The well-known "Composite candles" of this form are made from a combination of this oil at low melting point and the hard stearic acid of the palm oil, their relative proportions varying according to the varying condition of the price of each in the market. We have yet to speak of the production of candle material from the novel substance, petroleum, a natural product of the kingdom of Burmah, where it wells up from the ground, like naphtha, to which it bears a very striking resemblance. It is a mineral substance composed of a number of hydrocarbons, varying in specific gravity and boiling points. The preparation of this dark orange-colored liquid is conducted simply by distillation: a number of very different products coming over at different temperatures, ranging from 160° to 620° Fahrenheit. The first product to distil is the extraordinary liquid termed sherwoodole, a detergent very similar to benzine collas, the well-known and popular glove-cleaner, removing grease-stains like that liquid, but without leaving any smell behind. A very beautiful lamp-oil, termed Belmontine oil, is the next product. This oil burns with a brilliant light, and, as it contains no acidifying principle, it never corrodes, like other oils, the metal work of the lamps. The two next products are light and heavy lubricating oils, used for lubricating spindles at a much cheaper rate than the ordinary oils now in use. The last product to distil is termed Belmontine, a new solid substance of a most beautiful translucent white, somewhat resembling spermaceti, and forming a candle of a most elegant appearance, very similar to the paraffine lately distilled from Irish peat. In addition to the candle-making materials already mentioned, there are numerous others, which are worked when they can be procured cheaply.

The candle-making material being now fit for molding, let us introduce the reader to this department of the manufactory. A room, 127 by 140 feet, is fitted up throughout its entire extent with parallel benches, running from one end of the department to the other. In these benches, ranged close together in a perpendicular direction, are the candle-molds. How many thousands of these may be counted we scarcely like to say; but, viewed from above, their open mouths must present the appearance of a vast honeycomb, commensurate with the size of the room itself. Along the top of each bench, 104 feet in length, there runs a railway, and working on this railway is what may be termed a candle-locomotive—a large car running on wheels, containing hot candle material. The wicks having been adjusted truly in the long axis of the mold, the locomotive now advances, and deposits in each line of molds exactly enough material to fill them, proceeding regularly from one end of the bench to the other, setting down at different stations its complement of passengers. After a sufficient time has elapsed to allow them to cool, preparations are made to withdraw them from their molds. This is done in the most ingenious manner: in an apartment close at hand an iron boiler of great thickness is filled with highly compressed air, by means of a pump worked by a steam-engine; pipes from this powerful motive communicate with every distinct candle-mold, and convey to it a pressure of air equal to 45 lbs. to the square inch, about the surface of the diameter of a candle. These candle-molds and the air-pump constitute an immense air-gun, containing thousands of barrels, each barrel loaded with a candle. The turning of a cock by boys in attendance lets off these guns, and ejects the candles with a slight hissing noise. This fusilade is going on all over the room throughout the entire day, and in the course of that time no less than 188,160 candle projectiles, weighing upwards of fourteen tuns, have been shot forth. The intelligence and care with which the attendant boys catch these fatty missiles, is accounted for by the fact that Price's Patent Candle Company rectify their labor as well as their raw material; the excellent schools established by the managing directors, Messrs. Wilson, enabling them to select the more careful lads for those departments requiring particular attention.

The visitor should notice particularly the wicks of these candles, as upon their method of preparation the abolition of the snuffers—that grand reform in the matter of domestic light—depends. These wicks, in the first place, are made very fine, the high illuminating power of the stearic acid enabling a fine wick to give far more

light than the coarse wick of the common "dip." Again, the particular twist given to the wick when it is plaited, and the wire with which it is bound, causes it to project from the flame when burning. Palmer's candle-wicks, it will be remarked, are twisted upon each other, the relaxation of the twist as it burns answering the same end—the projection of the burning cotton through the flame and into the air, which immediately oxydizes it, or causes it to crumble away, thus obviating the necessity of snuffing. Here we see an extraordinary example of the manner in which a very simple improvement will sometimes interfere with a very large trade—the simple plaiting of a wick doing away with one of the most extensive branches of hardware in Birmingham and Sheffield.

The candles are sent forth into the market in pound packets, packed in highly ornamental boxes. The manufacture of these boxes is not the least interesting part of the manufactory. In consequence of the duty on paper, it was necessary to look about for some cheap substitute, and deal was finally adopted. A plank, one foot wide by four long, is planed into no less than 140 shavings of that size: these are pasted on one side with a very thin straw paper, so as to form the hinges for the sides. They are cut out by a machine to the required sizes, and rapidly made up afterwards by hand, the cost being truly insignificant. For the manufacture of the night-light cases, the shavings are rolled into a cylinder, pasted, and then cut off to the required lengths in a hand-lathe.

Thus much for the material lights of Price's Patent Candle Company. A subject of still greater interest, perhaps, would be the lights they are cherishing in the shape of the admirable training-schools attached to this factory, to which we shall probably refer in another article. DR. WYNTER.

A JAPANESE PRINTING-OFFICE.

A Hong Kong correspondent of the *Boston Traveler* gives the following account of a Japanese printing-office:

"I at once pushed ahead, and crossing the little stone-arched bridge, which unites Desima with Nagasaki, I was soon in one of the principal streets, and, opening a large closed gate in the high and massive wall on the street, stood in the spacious court before the printing establishment. How much in contrast the taste of the Pagan Japanese with that of the Dutch Christians! Elegant shrubs and flowers adorned this court in front, while in the rear of the building rose tall pines and evergreen trees, which stretched their long, verdant arms over the building, as if to adorn, protect, and bless it. The structure itself is spacious, neat and even handsome, the roof being in the Chinese style of architecture in their temples, and covered with tiles, interlacing, and bidding defiance to water, while the floors of two rooms in the office proper are covered with neat mats, and surrounded by sliding paper walls, while the ceiling is of wood, handsomely painted. The establishment belongs to the government, and is managed by the government, whose officials were seated, as usual, on the floor, and doing little or nothing, since thirty days were to be spent, according to usage, in silently mourning for the Emperor, who had just deceased, during which time all public offices are closed, and all public business suspended. Indeed, it was quite uncertain whether, in these circumstances, I could gain admitance. With the usual Japanese courtesy, however, the doors were opened, and I was freely and politely shown all the apartments and materials of the establishment.

"On one side of the office was a hand-press of respectable size and in good condition, while on the other side was a 'power-press,' moved by a wheel of large diameter, in perfect order, and and of sufficient size to print the largest sheets usually struck of in the United States. The press was not in motion, for the reason before given, and the rollers were suspended over the wall, and reams of paper piled up near the press, and the workman hanging about idle, as if they were patiently waiting for the expiration of the days of mourning, to resume their labors. Besides these, there was another press, of the smallest dimensions, on which, when I made a second visit, sometime after, two men were striking off two octavo pages of a new Japanese work on natural history, the edition consisting of thirty copies. It was the enterprise of a young Japanese doctor, who had been instructed by a Dutch physician residing in the city. Stands and cases were arranged as with us, one side of the office having the Roman type used in printing books and pamphlets in Dutch, and the other the Japanese; for types in the Japanese character are now cast in Holland, and have displaced the wooden blocks formerly used, the boxes of the Japanese letters were arranged on the same principle as with us, but in different order. I tried my hand in picking up some of these strange characters, but probably a good deal to the divertisement of the Japanese compositors. The types, both Roman and Japanese, were almost new, and everything indicated that the Japanese were far ahead of the Dutch in the typographical art, as well as in everything else.

"Some of the paper used in printing is thick, white, and close, and receives a fine impressson. It is made neither of rags nor cotton, but of the bark of a tree. called the 'paper mulberry,' and is cheap as well as good, The printed sheets were hung up over head to dry, just as with us. A dozen or twenty hands are employed at the case and the press, who appeared to be expert workmen, and quite courteous. The establishment is managed entirely by the Japanese, not a single Dutchman being admitted either as superintendent or workmen. The Japanese are almost universally readers, having their schools established by law, and books for the use of the scholars and the people. Most of these books are small, and full of the most ludicrous illustrations, from which *Punch* must have borrowed many of his ideas, though inferior. Most of the books are of little value in morals or science, while not a few are licentious and obscene. The Japanese have now got the idea that the English is a universal language, and the Dutch of little value, from which impression, and a very just one, the young people who are destined to business, or are ambitious of political distinction and honor, are seized with a pasion to learn our language.

"Little as the Dutch have done for Christianizing and civilizing Japan—and rather they have been the saddest curse ever inflicted on any nation since the earth was inhabited—they were willing, for the sake of money, to procure the printing materials from Holland, which the Japanese now use. The Japanese will not need to send abroad for them again; since their own wonderful ingenuity is able to provide them hereafter as they shall be needed. I ought to have added that I found a book-bindery close to the press."

RAIN AT DIFFERENT ELEVATIONS.

MESSRS. EDITORS:—Your correspondent, H. B. Livingston, explains the reason why the rain-gage shows a greater deposit of water at the bottom of a mountain than at the top, or at the base of a tower than on its top. According to generally-admitted science of the formation of rain, he explains rightly. The Espian theory of thunder-gusts would give such result, as it does not necessarily require two differently tempered airs to mingle to produce a deposition of water. It only requires atmosphere to come in contact with something colder to produce a deposition of a portion of its water. How the water is retained in the atmospheric compound is not understood; and it is as mysterious in its combination as is electricity with air. When airs of two different temperatures commingle, the resulting compound has its capacity for water lessened, and while this operation is going on, the transparent atmosphere becomes discolored; it becomes cloud. Where the commingling of these two differently tempered airs increases while the cloud is forming, it becomes surcharged with atoms of rain, and must let the surplus fall; and down it comes in rain-drops. These drops being colder than the different strata of air through which they fall, and each successive strata of atmosphere below being denser than those above, the drops will increase in volume till they strike the earth.

In my observation on rains, I see much yet to be explained. The thunder-gust is different from the local shower without thunder; the settled rain is different from either of the others; but there is probably a general principle that governs them all.

When sailing in my balloon under a cloud of rain, that is, touching its lower surface, the rain-drops cannot be heard; the balloon collects the rain there as it does the dew of the evening, when I let it stand out during night. When the rain running down from the surface of the balloon (while the latter is immediately beneath and touching the lower surface of the cloud) is slight, I have found a copious shower dashing and rattling on the balloon as soon as I would descend towards the earth.

My observations on clouds teach me to believe that clouds and rain are formed in other ways than by uprising currents only. I have seen clouds form from the combination of two different currents; one from the south-east, and the other from the north-west, each blowing very slowly, and the rain forming in a slow drizzle at first.

How clouds can be buoyed up and retained in the air puzzles me the most. If all clouds are the same, it would seem that a cloud at first formed is held suspended in the air, on the same principle that very thin flakes of sheet metal float in water. Metal is heavier than water; nevertheless, a cambric needle, if lightly laid on the surface of water, will not sink.

I have read much of clouds attracting and repelling each other, but I never yet saw the repulsion of them. I often see them approaching and commingling, but this always appeared more like a mechanical than an electrical action. JOHN WISE.

Lancaster, Pa., August 31, 1859.

THE ENGINEERING OF SPIDERS.

MESSRS. EDITORS:—Some few days since, while writing on the primitive machines, I had just finished treating of the cord as one of these, when my attention was directed to a small spider descending from the underside of a table in the corner of the room, where it had stationed itself unmolested. A large horse-fly, many times too large for the spider (which was very small) to manage, had by some means, become disabled, and lay on the floor. The spider descended to the fly, and, with some caution, began to entangle it in its web, and soon had it completely bound. The spider then ascended to the table, but soon descended again; and thus continued to ascend and descend for some time, fastening the fly more completely each time it returned. I was at a loss to know its object in binding the fly so safely on the floor. Soon, however, it ceased descending, and appeared to be busily employed at its station near the table. I could not conceive what its object was in passing about so very actively; but imagine my surprise when, in a short time, I saw the fly leave the floor, and begin to ascend towards the table. This was soon explained. The spider had attached a number of cords to the fly, extending from the table, and by stretching each to its greatest tension, and confining the upper end, the elasticity of all the cords (some 50 or more) was combined in raising the fly. By continuing the process of tightening one cord at a time, in some 15 or 20 minutes the fly was raised to the table, and there deposited for future use.

Here was a lesson in mechanics taught by a spider; and where is the difference, in principle, between this machine of the spider and the cord, as used with a number of pulleys, by man? The spider, as he had no pulleys to enable him to use one long cord, and tighten the whole by applying a force at one end, as man does, effected the same object by using a number of cords, and tightening one at a time, thus obtaining the force of them all. The sum of the tension of all the cords equal the intensity of the force in each case. The principle is the same. J. B. CONGER.

Jackson, Tenn., August 29, 1859.

POISONOUS VINEGAR.—The Philadelphia *Ledger* says that chemical examinations go to show that most of the vinegar made in New York is adulterated with sugar of lead, vitriolic acid, and other poisonous metals and minerals. We do not believe the statement is correct, but presume it was obtained from a source which was thought to be reliable. Sugar of lead is no doubt very poisonous; but for what purpose would any sane person use it for in adulterating vinegar? It cannot make it sharper to the taste, but the very reverse; and it would therefore be very absurd to use it for such objects.

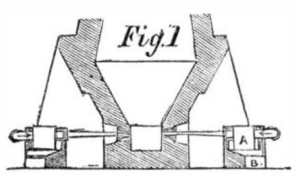
SHEEP AND WOOL IN AUSTRALIA.—The increase of sheep, and consequently of the wool trade of Australia, is truly astonishing. In 1788, 29 sheep were imported into that colony from India. There are now at least 10,000,000, In 1816, 13,600 lbs. of wool were sent from Australia to England; last year, 50,000,000! The climate of Australia is said to be peculiarly adapted to the breeding and rearing of sheep, as well as for preserving, if not improving, the finer descriptions of wool.

HOT-AIR OVENS FOR IRON FURNACES.

We commence, this week, a series of most interesting and useful articles on the above subject, taken from a paper read before the Institution of Mechanical Engineers, and which we condense from the London *Engineer:*

The first idea of heating the blast, prior to its entrance through the tuyeres into the furnace, is due, as is now universally admitted, to Mr. Neilson, of Glasgow, who also has the merit of its first practical application early in the year 1829. Previous to that period, the settled and firm conviction of iron-masters appears to have been that the colder the blast the better the quality, and the larger the quantity of iron produced from each furnace in a given time. This conviction was the result of long-continued observations, which showed that the produce per furnace was always more in winter than in summer; and as the difference most appreciable to the furnace-managers between the one state of circumstances and the other was the temperature of the atmosphere, this, without further investigation, was at once charged as the sole cause. Subsequent research, however, has shown that the mere variation of temperature in the atmosphere from freezing point to summer heat had nothing to do with this result, which is owing to a cause still as actively in operation and as sensibly felt with the blast heated to a temperature of 600° or 800° Fah., namely, the excess of moisture, in the shape of invisible vapor, contained in the air in the warm weather as compared with the cold. So strongly rooted, however, was the belief that the temperature was the only circumstance affecting the make of iron, that the greatest efforts were made in summer to obtain the blast as cool as possible; among other plans, by passing it over cold water, with a result, of course, contrary to expectation, owing to a partial absorption of the water. On this point, some most interesting evidence was adduced at the instance of Mr. Neilson, in the great hot-blast trial at Edinburgh, in 1843, when all the leading and most experienced iron-masters of the Staffordshire district—Mr. W. H. Sparrow, of Stowheath; the late Mr. James Forster, of Stourbridge; the late Mr. Barker, of the Chillington Works; and the late Mr. Ward, of Priestfield—stated it as a fact that, previous to the introduction of hot-blast, the universal opinion of furnace-managers was that the colder the blast the greater the produce of the furnace.

This being the state of practice, and this the state of the science and opinion of men of skill in the iron trade, it occurred to Mr. Neilson, who was fortunately out of the iron trade, and consequently unencumbered with either its practice or its prejudices, that the power of the blast in igniting the materials would be greatly increased if, in its passages to the tuyeres, it were heated to a very considerable temperature. This idea was the result of careful and laborious thought on facts which came under his observation at the gas-works at Glasgow, with which he was connected. Having convinced himself, by experiment on a small scale, of the correctness of the idea, he at once set about embodying it in a practical shape, the first application of the plan being at the Clyde Iron-works, Glasgow, early in 1829. By the kindness of Mr. Neilson, the writer was able to present the institution, with a correct drawing of the apparatus then first made use of, which is show in Fig. 1. It consisted of a small wrought-iron heating-chamber, A, about 4 feet long, 3 feet high, and 2 feet wide, in construction similar to a wagon-head steam-boiler,

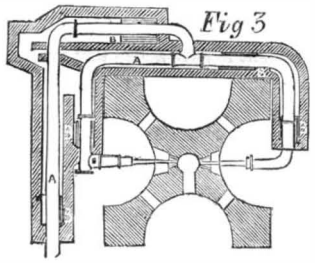


which was set in brick-work with a grate, B, below, similar, in all respects, to the ordinary steam-boiler. The cold-blast entered at the end immediately over the grate, and passed out to the tuyere from the other end, being warmed in its passage along the chamber to a temperature of about 200° Fah. There was one of these heating-chambers to each tuyere; the total area of fire-grate per tuyere was about four square feet, and the area of heating surface of the chamber, 35 square feet. This apparatus, although very imperfect, and capable of raising the temperature of the blast to a very moderate degree only, was yet a very successful beginning; and the result produced in the blast-furnace soon proved that the idea was one destined to work a vast change.

Although this first application of hot-blast may now appear crude, it is doubtful whether, if divested of all subsequently acquired experience, any better or more practical mode of testing the invention would have occurred to any of us: so difficult is it to invent, so easy to see defects afterwards. The latter facility soon became apparent to Mr. Neilson, for the boiler-plate chamber shortly succumbed to the heat and oxydation, and called for renewal. This being rather an expensive process, he began to look out for something more durable; and here, fortunately, his experience in gas-making came to his aid; for, finding that the cast-iron gas retorts both endured a higher temperature and lasted longer under more trying circumstances than the boiler-plate chamber. he at once resolved to substitute a cast-iron retort-shaped heating vessel. This is shown in Fig. 2, and was found to be a great improvement on the original plan, lasting longer, and raising the temperature of the blast to about 280° Fah. It was constructed at the Clyde Works, about the latter part of 1829. It consisted of a cylindrical cast-iron tube, A, bottle-shaped at each end, for the admission and discharge of the

blast, about 2 feet 9 inches diameter, and 6 feet long. As in the former case, there was one of these heating vessels to each tuyere; but the heating surface was increased to 55 square feet per tuyere, or one and a half times the surface exposed to the first application; and the grate area was increased to 11 square feet, or nearly three times. In the previous case, it will be observed that the top of the wrought-iron chamber was exposed to the atmosphere, thus leading to a great waste of heat. But in this second case a great improvement was made in the mode of setting, the heating vessel being wholly enclosed within the brick casing over the fire, thus preventing any waste of heat, and producing, with the increased heating and grate surface, the increase of temperature from 200° to 280° Fah.

Having thus discovered the great advantage of this mode of setting the heating-chamber entirely within the flue, but being still dissatisfied with the result at present obtained, and bent on further improvement, Mr. Neilson designed the greatly improved apparatus shown in Fig. 3, plan view, which was erected at the Clyde Works in 1830. In this plan there is a great extension of the previous idea. Instead of one grate per tuyere, of 11 square feet, there are here five grates, B B, for two tuyeres, giving an area of 28 square feet of surface per tuyere. The solitary tubular heating-chamber over the grate is here lengthened out into a continuous pipe, A, 18 inches diameter, enclosed in long lengths of flue, extending to a total length of about 100 feet, giving 240 square feet area of heating surface per tuyere. Much ingenuity is displayed in the arrangement and setting of both the grates, pipes and flues of this apparatus; and it was attended with great success in raising the temperature of the blast to more than 600° Fah., so as to melt lead. This may be called the first example of really hot-blast being obtained.

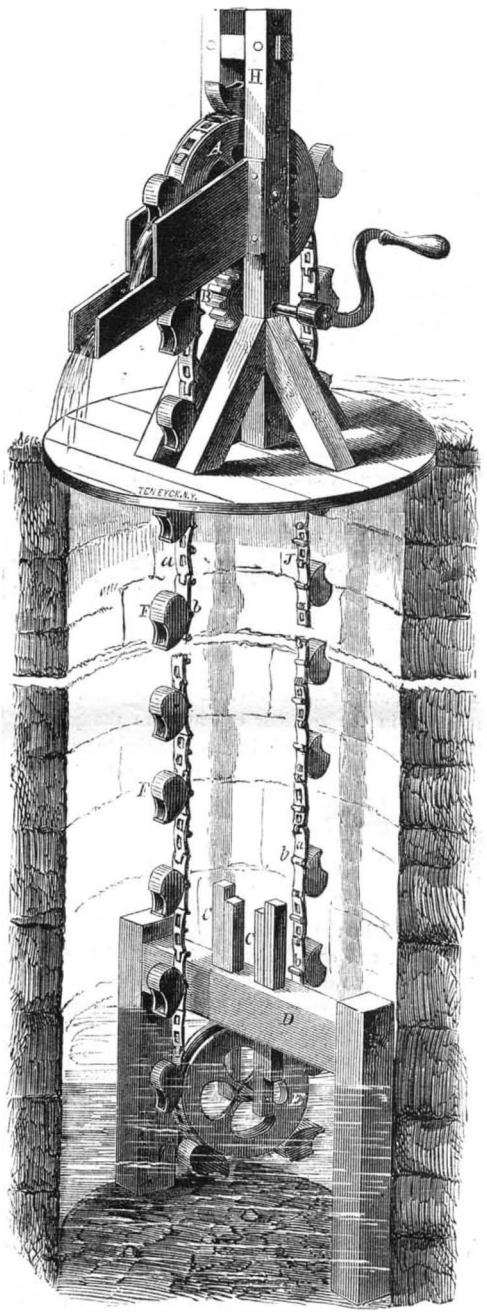


Defects, however, soon began to manifest themselves. With the lengthening of the heating tubes, and the greater general complication of the apparatus, a difficulty had now crept in unawares, destined to be highly mischievous, and to test the ingenuity of a whole generation of furnace-managers. It arose from irregular and uncompensated expansion and contraction, inducing that serious defect of hot-blast ovens, leaky joints. With the present experience in these matters, it will be seen at once how very open an apparatus of the above construction would be to such a defect; the great length of pipe expanding and contracting to a perceptible extent at every change of temperature, and consequently straining every branch, bend and joint of the whole range. The leakage at the joints was to some extent overcome by covering them with a ring of cast-iron; followed, as a result, by the breaking of the pipes, a defect of greater magnitude. The very great improvement which took place in both the produce and the yield of the furnace, consequent on the increased temperature of the blast, made it necessary to set seriously to work to overcome the new difficulty, and to construct an apparatus capable of maintaining the heat of the blast uniformly at this increased high temperature, without leakage or breakage of the pipes.

[To be continued.]

IMPROVED HYDRAULIC ELEVATOR.

The great fault of water elevators which are attached to an endless chain, is that they do not raise enough for the amount of labor expended; they are too wasteful, as they afford so many opportunities for leakage during the passage of the water from the cistern to the spout. The subject of our engraving overcomes this difficulty in two ways: first, by having the buckets in such a shape as to retain all the water received until the proper time to discharge it into the spout; and, secondly, by preventing any shaking of the buckets in their passage up, by making the chain in such a manner as to ensure its rigidity.



On the top of the well a frame, H, is mounted, carrying a flanged wheel, A, provided with cogs between the flanges, so that it can be rotated by another cogged-wheel, B, and crank handle, I, below it. In the bottom of the well is another frame, D, in which a flanged guide-pulley, E, is secured by double-beveled keys, C. An endless chain, J, formed of curved links, *a*, having projections, *b*, upon their backs, which fit into the spaces between the cogs on the flanged wheel, A, so that certainty and steadiness of rotation is secured. The buckets are of the form shown, the mouth being protected by a sort of scoop or spout, which holds the water when the bucket is in a horizontal position, and does not allow any to escape until the mouth has acquired a considerable inclination downwards; but the curve of the mouth of the bucket is not so great as to retain any water that should be discharged into the spout, G. With this pump, there is no liability of splashing so as to rust the wheels or

nails in the framing; and with it, water can be elevated to any height, or from the deepest well. The invention is also applicable to ship's pumps, by having the ends of the shaft of the lower wheel to move in a groove, which is an arc of a circle with the axle of A for a center, and a weight attached to the lower shaft to keep the two sides of the endless chain perpendicular during the motion of the ship, so that the buckets will retain their contents until they arrive at the discharge spout.

The inventor is D. Du Pre, of Raleigh, N. C., and he will be happy to give any further information, upon being communicated with. The patent is dated June 7, 1859.

CANNEL COAL.

The constituents of this coal are carbon, hydrogen, oxygen, nitrogen, potash, some silica,, and occasionally a trace of sulphur. When it is subjected to dry distillation, the equilibrium of these elements is disturbed, and new combinations take place. Hydrogen and oxygen readily vaporize, and from affinity unite, forming compounds, partly with each other, partly with carbon, either singly or in conjunction. If not interfered with by some other agent, in combining they form water; while the excess of hydrogen takes up carbon according to the temperature, forming olefiant gas, carbureted and bicarbureted hydrogen, while other compounds result from the common action of the other elements on the remaining carbon. The different gases evolved from the still condense to a liquid in the worm, and are subsequently purified in various ways, as they are successively produced under different temperatures. The first liquid is *naphtha*, a light, volatile, and very inflammable oil, which is used as a vehicle for resins, such as india-rubber, &c., in varnishes; for extracting perfumes from flowers; and which may be converted into benzole, an oil preferable to alkalies for separating fatty oils and grease from wool, silk, &c., since it does not injure the colors, and is free from resinous impurities. In combination with nitric acid, *nitro-benzole* is formed, which can replace the oil of bitter almonds in perfumery. The next oil appearing is a light oil, now extensively used for illumination, "kerosene," "coal oil," or "carbon oil." It is not explosive, and has the property of preventing decay in wood impregnated with it. On redistillation *creosote* or *carbolic acid* is produced, which prevents decomposition in meat and other organizations. From *creosote* another fluid is extracted, *carboazotic acid*, which gives a beautiful and permanent straw-yellow color to silks and other fabrics, and has been successfully used as a febrifuge. The third substance produced is a heavy, fatty oil, which, when refined, under the name of lubricating oil, is extensively used for machinery, and which, by the action of cold yields *paraffine*, a beautiful white crystallized substance, which, when subjected to pressure, forms candles superior to sperm. From this heavy oil may also be extracted *anyline*, which, in combination with other agents, gives a blue dye equal to indigo, or a fine red. The coke remaining after these processes, besides its use as fuel, when left long in contact with iron, yields a fine plumbago. The ammonia obtained in distillation may be used as a rich fertilizing agent, mixed with plaster, or lime.

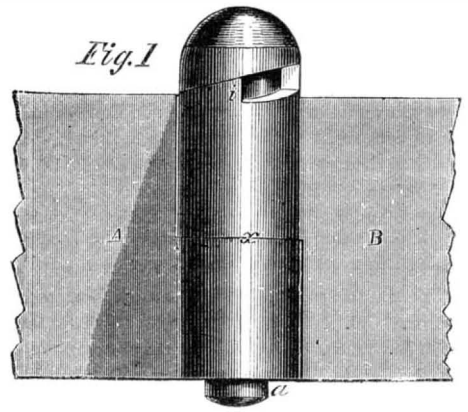
KYANIZED TIMBER.

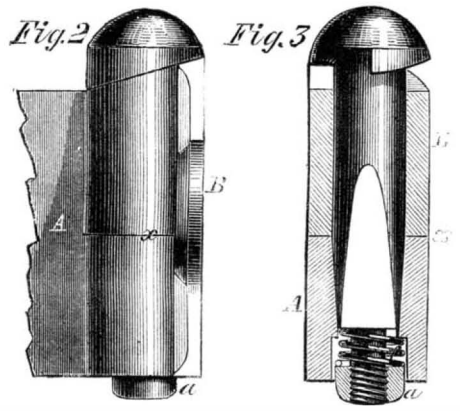
We have frequently directed the attention of our railroad companies to the benefit that would accrue to them by the use of kyanized timber for sleepers and bridges. A correspondent of the *Railway Times* cites a case in which the benefit of such prepared timber has been very fully demonstrated, he says:—"The best proof of its value, however, is furnished by the aqueduct of the Alexandria Canal over the Potomac river at Georgetown, D. C. The whole of that structure, with the exception of the oak posts in the trusses, is built of Carolina pine, which as well as those posts, was all kyanized. A more severe test of the efficacy of that mode of preserving timber could not be devised than it is there subjected to, and has been for 16 years, As in all such structures, the leakage is considerable, and much of the timber in it is wet during the season for navigation, and at other times dry, while at all times it is exposed to the vicissitudes of the weather. Upon a recent inspection, the Carolina wood was found to be perfectly sound; and the same may be said of the oak posts, excepting in cases where they were crushed or split by the enormous weight upon them, though they were unseasoned when kyanized."

HOWELL'S IMPROVED RETAINING HINGE.

This hinge retains the sbutter to which it may be attached in either of the two positions, open or closed, and does not permit of the connections being shaken out by the rattling of the shutters by the wind or other force, and also prevents the unpleasant noise produced by the same cause.

Fig. 1 shows the hinge, A being the portion screwed or otherwise attached to the wall or jamb of the house, and B is the portion screwed to the shutter. The two halves of the hinge are fitted together at *x*, and are enlarged at the ends where they meet. Through these enlarged ends passes a pin or bolt, seen in the section, Fig. 3. The pin is round on that portion which passes through the round hole in the part, B, and square where it passes through the square hole in the lower part, A, so that it is prevented turning in the lower





half. Its lower end is round, and is furnished with a nut, *a*, which can move freely in a recess in the half, A, and a spiral spring, *f*, is placed so as to bear with one end against the top of the recess and with the other against the nut, *a*, thereby tending to depress the bolt. The head of the bolt has on its under side a notch, one side of which is vertical and the other side inclined. A projection, *i*, on the portion of the hinge, B, corresponds to the notch on the head of the bolt. This notch and projection are so arranged that when the shutter is placed back against the wall, as in Fig. 2, the projection will drop into the notch. Only one hinge of a shutter has occasion to be constructed in this way, the other one may be of the ordinary kind. As the shutter with the half, B, of the hinge is being opened, the inclined edge of the projection, *i*, bears against the inclined edge of the notch on the bolt, the latter gradually rising until the shutter is folded back against the wall, when the bolt, by the reaction of the spiral spring, will fit into the notch, thus retaining the shutter in its position. When the shutter has to be closed, all that is necessary is to apply the finger to the lower end of the bolt, thereby raising the latter, when the shutter is at liberty to be turned away from the wall.

This great improvement, which is also applicable to doors and gates that have to be held back, is the invention of Levi T. Howell, of Burlington, N. J., and any further information can be obtained by addressing DeWitt C. Taylor, Philadelphia, Pa. The patent is dated April 26, 1859.

THE CROPS.—A correspondent writing from Indiana says, "The wheat crop which is now being rapidly taken to market, is fine, perhaps better than we have had for four years past: price 85 and 90 cents per bushel at the warehouse. Corn is looking fine, and there will probably be an abundant crop." This seems to be the case in reference to the whole corn crop of the country.

PAINTS FOR ROOFING AND OTHER PURPOSES.

MESSRS. EDITORS:—A company in Philadelphia, Pa., are introducing into this city what they call a new metallic paint, which is stated to be mixed in a peculiar way, and that it is a permanent and valuable covering for metallic roofs, much more so than any of the other paints which are now used for this purpose. A new name given to fruit does not improve its flavor, neither does a new name improve the qualities of an old paint. The paint spoken of above, shows, by a quantitative analysis, that its composition, when first ground, is:—

Linseed oil	20
Graphite (blacklead)	80
	100

This is an old paint; we have used it many years; and we have more than a tun on hand at present. It is a good paint for iron roofs, ships' bottoms, &c., but not good for copper, or new tin. The chemical action on paints, of iron, copper, and tin, is very different in its effects, as all chemists know. For new tin roofs, we find the following paints to be the most durable, viz:—pure English Venetian red, ochres, Spanish brown, and Canadian burnt sienna. The words "metallic" and "mineral" are terms that are given to most all newly-discovered paints; but they are very indefinite in their meaning, when thus applied. We see no reason why there should be any mystery in this matter, and any impropriety in telling our employers what materials we use, for he who pays for the materials ought to know what he has bought. Ex-mayor Mickle has had his roofs, at Bayside, Flushing, L. I., recently painted with this graphite, which has excited much curiosity, it being considered by many as something new, and likely to supersede all others, in durability, &c.; but such statements are not based upon facts in our long experience in painting and chemistry. This graphite, as an oil paint, is not new, neither is it more durable than the other paints we have mentioned in this article.

QUARTERMAN & SON.

New York, August 29, 1859.

SIMPLE PLAN OF OILING JOURNALS.

MESSRS. EDITORS:—Noticing, in your last number, the engraving and description of a device for oiling journals that are difficult to reach, it calls to mind a plan I adopted some time since; and if it can be of any use to others, they are welcome to it.

When in charge of the Portsmouth (N. H.) Steam Cotton-mill, we had nearly 300 journals in one weaving-room to oil; and as the room was very high, it was quite a job to oil them well, and not waste the oil or drop it on the work below. I found a man doing it by means of a ladder, which was furnished with hooks at the end to hook on to the shaft. With a lazy man, it took the best part of the day; and he was all the time in somebody's way.

I took a piece of one-fourth inch gas-pipe, long enough for a man standing on the floor to reach with it up to the journal, and fitted to it a piece of wood (similar to the stock of a gun-barrel) to stiffen it. At the bottom I attached a small force-pump, with the piston operated by a spiral spring one way, and worked the other way by pulling it with the finger, forcing the oil out at the bent top directly into the cap on the journal, the quantity of oil being regulated by the distance traversed by the piston, and that regulated by a stopper attached. The force-pump may be supplied by a copper vessel of any desired shape or size, similar to an air-gun.

By using this, the oiling could be done in about one hour, saving seven-eights of the labor, and rendering the operation much more easy to the workman. Then the supply of oil which the bearing receives is always exactly adjusted to the desired quantity, which, by the ordinary process, is seldom done. There are also other advantages which a clean and practical man can appreciate; the shape of the tool enables it to be hung up out of the way; and if the bearing is in a dark place, it is very easy to feel the hole in the cap, and thus oil the journal with certainty.

EDMUND BACON.

Ashburnham, Mass., Sept. 3, 1859.

A great tobacco sale took place in this city on the 30th ult., and was felt to be a failure, as many articles on the catalogue were withdrawn. One firm alone bought 600 hhds. The lots sold amounted to $750,000.

EXPERIMENTS WITH COAL-BURNING LOCOMOTIVES.

A series of protracted experiments have been conducted on the Pennsylvania Central Railroad, at Altoona, and Mr. S. Hume McLaurin has briefly communicated the results to the *North American Gazette*, as follows:—

"Except one single machine, the experiments were made with freight engines, and with freight trains, or rather a freight train, consisting of 40 cars, loaded with coal, in the round trip from Altoona to Mifflin and back, a distance of 164 miles, the running time being 12 miles to the hour, or 10 miles, including stops. The mode of procedure was for each engine to go down to Mifflin one day and back the next; and if, from any accident of any kind, or from bad weather or unforeseen detention, the trip did not fairly develop the performances of the engine, it went for nothing, and the trip was repeated. This 'Mifflin trip,' as it was called, was the great leading feature of the experiments, although it was preceded by another short one from Altoona to Gallitzen, on the mountain, a distance of 12½ miles. Now, in this trip, without presenting the details of evaporation, and the particular features of the several engines, I may state the notorious fact that our engine (the Phleger boiler), made it with 75 bushels of Broadtop coal, and 84 of Pittsburgh; and that, with the former, there was not an engine that came nearer than 20 per cent. of her, for Dimpfel's came the nearest, and she burned 87 bushels, besides extra wood, making some three bushels more.

"It it true that, with Pittsburgh coal, the 'Blue Ridge' came within three or four bushels of her, but it is also true that she had not the water grate connected with the crown sheet, but an upper water deflector through which the grate passed some six inches from the crown, both leading features of Phleger's boiler. The coal really used by the several engines was as follows:—

	Pittsburgh coal. Bushels.
Phleger's (fractions omitted)	84
Blue Ridge	87
Dimpfel's	100
Gill & Co.'s	104
Baldwin's	104
Winans'	107

"Of Broadtop, I think all took something more, except Dimpfel's (87) and Phleger's (75), as above stated. These comprised all the engines tried in the regular experiments, and we claim, what, indeed, is notorious, that the results are no criterion for a passenger train. We have now a passenger engine on the East Pennsylvania road that may be seen any day at Reading, running with 18 pounds of anthracite coal to the mile.

S. HUME MCLAURIN."

PITTSBURGH COAL-OIL.

Mr. Gould, of Rochester, has written a letter on the profits of manufacturing coal-oil, that makes some very remarkable statements, if not too highly colored. Quite a number of these establishments have recently sprung up in the circle of which Pittsburgh is the commercial center. In fact, Mr. G.'s statistics are, to a great extent, drawn from the purported experience of these companies.

For example:—"A Pittsburgh company—the Lucesco Oil-works—have sprung up within the last few months, at a cost of $150,000. They employ 150 hands; they can turn out, every 24 hours, 5,000 gallons of crude oil. They assert that each tun of Pennsylvania cannel coal produces from their retorts 40 gallons of a material which, once distilled, leaves 30 gallons of a commodity or merchantable article known as crude oil, and this at 30° of gravity by the scale of Beaume. This commodity, still further treated by the refiners, yields, from every 100 gallons, about 80 gallons of finished oils, for burning and for lubrication. In short, they expect from each bushel of cannel coal one gallon of crude oil—coal costing about five cents, crude oil selling for about 35 cents. We hear of much greater things at greater distances."

Mr. G. also gives the estimated cost, as furnished by two practical manufacturers, the result of which is:—

The daily product of a coal-oil establishment is set down at	$570 00
The daily cost	185 00
Daily profits	$385 00

If these enormous profits are not sadly mis-stated, those gentlemen who have invested in this business must soon realize handsome fortunes.

TELEGRAPHIC EXPLORING EXPEDITION TO THE NORTHERN ATLANTIC OCEAN.

We learn from the Boston *Traveler* that the bark *Wyman* sailed from that city on the 20th ult. on an expedition to the Northern Atlantic Ocean, to survey a route for a telegraphic cable by way of Greenland, Iceland, and the Shetland Islands, to Glasgow. The vessel has been chartered by Col. T. P. Shaffner, who goes in her, accompanied by his wife and son, and two gentlemen of Worcester.

Just previous to the sailing of the vessel, John A. Dana, Esq., of Worcester, presented Col. Shaffner with a signal flag, bearing the Masonic emblems, the square and the level. He spoke of the magnitude of the enterprise originated by Col. Shaffner, and in reference to the flag, said it would make him respected wherever he might go.

Col. Shaffner, in reply, spoke at length of the purposes of the expedition. He had received from the King of Denmark the exclusive right to lay a cable in Greenland and Iceland, and spoke of the advantages this route would have over any other in Europe, in cheapness of construction, shortness of connections, &c. He estimated the expense of laying the cable at $1,500,000. At the close of Col. Shaffner's remarks his friends bade him and family a hasty adieu; and the vessel went to sea with wind and tide in her favor. It is expected that the *Wyman* will reach Glasgow, after completing the explorations, in ten weeks, and return to Boston in four months. Col. Shaffner proposes to make for the Gulf of St. Lawrence. He will then coast along the shores of Labrador, to Hopedale, or about °56 north latitude, sounding occasionally so as to find a deep bay for the American terminus of the cable. Thence he will pass over to South Greenland, sounding there and examining the country for an underground line, in case it should be necessary to have a line across Greenland. Thence the route will lead to Iceland, where the bays will be sounded, and the shores examined for a land line. Thence the expedition will go to the Faroe Islands, where the wires will branch—one line running southward to Scotland, so as to reach England; the other to Bergen, in Norway. The longest cable will be from Labrador to Greenland, about 500 miles; thence to Faroe Isles, 270 miles; Faroe to Scotland, 200 miles; Faroe to Norway, 370 miles.

SHIP CANAL ACROSS THE ISTHMUS OF DARIEN.

A party of American engineers, under the charge of the Navy Department, are about to proceed to the Isthmus of Darien, to search for a practical route for a ship canal across the isthmus; they are instructed to explore the coast of the Caribbean Sea, with a view to test the statements of Gisborne and Cullen (Englishmen) that there is such a depression of the eastern Cordillera as to admit of the easy construction of a ship canal; the country west thereof to the Pacific Ocean being without any considerable elevation. Should the party not be able to find the gap of depression referred to, by reason of the overlapping of mountains or other causes, they may proceed to the Pacific side of the continent, and seek a practical route for a canal along the line traversed by Surgeon Caldwell, U. S. N., in 1857. This gentleman, inspired by the reports of old residents in respect to the existence of a region nearly level stretching across the continent, proceeded with a small party from the excellent bay of San Miguel, several miles in a north-easterly direction, up the navigable river Savana, and thence east, across the country to a point regarded as not far in a direct line from the Atlantic. Here, on account of the dearth of provisions, Dr. Caldwell was forced to close his tour and return to the Pacific coast. His conclusions, as reported to the Navy Department through his commanding officer, Com. Mervine, are as follows:—

1. That the summit level of a route from Principe northerly to the Atlantic is within eight miles of the Savana river, and being but 160 feet above the ocean level, will not prove insuperable to engineering skill in constructing a ship canal.

2. That there is a low tract of land extending from the summit level east to the Atlantic.

3. That a gap in the eastern Cordillera exists near the northwestern limits of the Caledonia Bay, on the Caribbean Sea. From the tops near the summit level referred to, such gap in the mountain was descried, and through it the great sea beyond. This was afterwards lost to the view of the explorers by the overlapping of mountain ranges.

The new exploring party are to have every desirable facilty for prosecuting their survey, and among other things a balloon, from which observations of the country may be taken by experienced aeronauts, through the use of what is called an "instanter-type." This gives the most minute objects, which are brought out by use of the microscope. Ravines, gaps or depressions thus discovered may, it is held, be easily found and explored, so as to demonstrate reliably whether there is such a route as has been so often asserted by both British and American officers or not.

ARTESIAN WELLS DENOUNCED.

The Santa Clara (California) *Farmer* pitches into the artesian wells of that place in a most awful manner. It says:—

"Artesian wells, rightly used, are a blessing—but abused, they become a curse. This unnatural irrigation, this flooding orchards, gardens, &c., has proved and will prove the greatest bane. The valley of Santa Clara is one of the finest valleys in all California, or it was, before the advent of 'artesian wells,' with a soil and climate equal to any county in our State, and superior to many. We have made critical examination of the result of this profane irrigation, and not a solitary instance have we found where we do not see a blight in some degree, and it is rapidly increasing. Within two years many fine and flourishing garden will have become so diseased as to literally die out. This system, as now practiced, is contrary to all principles of science. The fruit raised by the irrigation system is neither so high-colored nor so rich and juicy; the trees that produce the fruit look succulent in their branches; they do not ripen their wood well, and thus become subject to be destroyed by cold and frost. Trees and plants raised under this system, make long naked 'tap-roots,' and consequently bear fruit upon the extremities of their limbs. Artesian wells, if here and there only, would be well enough; but the system of irrigation should only be in accordance with nature's plans; the earth must not be deluged; gentle showering over the foliage at the evening hour to cleanse and refresh, is always good, and that is about all that is needed.

"But there is a great evil that will soon be felt at Santa Clara; in fact, it is now felt. The earth is parched up, and bitter and grievious complaints come from all quarters, for it is found that the evil is increasing. All the surface water of the entire country is drawn off by means of artesian wells—drawn down to their chancls, and then sent up again in one stream, instead of 10,000, through all the pores of the surface earth. Millons of gallons of water are hourly carried from the surface earth of Santa Clara valley, and emptied into the bay, thus changing all the plans of the Deity, and impoverishing and drying up the earth's surface, and unless this system is banished, the land of that famed valley will become almost worthless."

CLOCKWORK LOCK.

"Another novelty is one produced by an ingenious locksmith in Frankfort-on-the-Main, with a view to construct a strong box without any keyhole, and which even the owner himself cannot open. Inside is a clockwork, the hand of which the owner places at the hour and minute when he again wants access to the box. The clockwork begins to move as soon as the lid is shut, and opens the lock from the inside at the moment which the hand indicates. Time dependent upon the owner is the key to the lock—a key which can neither be stolen from him nor imitated."

[This paragraph, first taken from a German periodical, has been going the rounds of the daily and weekly papers, as something extraordinary novel and wonderful. Our cotemporaries, in bat-like ignorance of American inventions, do not seem to be aware that the invention is of American origin, and that such locks are now manufactured by the Automatic Lock Company at Milford, Mass., as the invention of our countryman, Mr. Holbrook.

PRICE OF GAS.—The price of coal gas to consumers in London is only 4s. 6d., sterling, per 1,000 cubic feet. For the same quantity, New York gas would be 10. 6d., or two and a third times dearer. Cannel coal in London is about the same price as it is in this city.

MARINE STEAM RAM.

A correspondent (W. J. P.) of the Philadelphia *U. S. Gazette*, claims the marine steam battering ram, lately built in France and England, as an American invention. He says:—"Although in consequence of the slowness with which our government machinery moves, as well as the unbroken peace we have enjoyed at our eastern seaboard for so many years, the other great naval powers have been the first to put the idea of a steam ram to a practical test, yet the truth is that this is an American invention, and the various British officers and men of science who are contesting for the honor of its first suggestion are but copyists or re-inventors.

"In the spring and summer of 1855, Charles Ellett, Jr., the well-known American civil engineer, then in Europe, addressed a series of letters to the Navy Department of the United States, urging upon our government the adoption of the steam ram as the cheapest and most efficient means of defending our coasts and harbors from an invading foe. Mr. Ellett's plan was simply to convert an ordinary steamer into a *floating battering-ram*, and enable her to fight, not with her guns, but with her momentum. This change of tactics would place any good commercial steamer in a position to sink, without firing a gun, any ship of war that now floats. He proposed to strengthen the steamer throughout in the most substantial manner, so that she might be run, head on, into the enemy, and burst in his ribs, or drive a hole into his hull below water line.

"In a subsequent communication to the Navy Department, dated August, 1855, Mr Ellett urged many convincing arguments in favor of his proposition, and cited all the cases of collision at sea, that had been reported in the European papers, since his previous letter, to prove the advantage which a vessel gained from being the one to give rather than to receive the shock.

"To the surprise of Mr. Ellett, with whom the idea of applying steam in the manner described was entirely original, the reply of the Secretary of the Navy informed him that a similar suggestion had been proposed to the Department more than 20 years before, and had been renewed many times since by various officers of the navy.

"To Commodore Barron, of the United States Navy, must be awarded the honor of having made, as early as 1832, the first suggestion of a means of attack and defense upon the sea, which is destined to effect as great a revolution in naval warfare as steam has in transportation, both on sea and land."

The old commodore was one of the most prolific inventors our country has produced.

In the London *Engineer*, of July 15, Mr. J. Grantham claims the invention of the "Steam Ram" for Admiral Sir Isaac Coffin, of the British Navy. He states that he heard the admiral and the great James Watt discuss the subject in 1824, and that such vessels were proposed to the British government in that year. Watt was consulted about making the engines sufficiently strong to resist the collision, and the vessel was to have an iron prow and also be cased with this metal. It seems to us that the merit of the invention belongs to either Coffin or Barron—both naval officers of fame, and Americans; but the one was in the service of his country, the other, and the older, in that of England.

TESTING CAR-WHEELS AND RAILS.

The proper system of testing any article—machine or whatever it may be—is to make it undergo such operations as those for which it is designed to be employed. In submitting rails or car-wheels to the common method of hydraulic pressure, or blows from a trip-hammer to test their strength, it would be all very well if they were designed to stand repeated blows, or continual pressure, but such experiments are of little value in testing their adaptibility for rolling motion and the action of trains, Mr. C. T. Liernur, C. E., of Mobile, proposes a plan for testing samples of rails and car wheels, which appears very feasible, and is thus described in the *Railroad Journal*, he says:—

"The proper system of testing anything, consists in submitting the article to a course of trials, exactly similar in its results to actual usage.

"For this purpose I lay a circular track, composed of three, four, or more rails, making a circle of from 20 to 30 feet in diameter. On this track I place a car supported by four, six, eight or more wheels, all the axles of which point towards the center—said car to revolve with, and to be attached to, a perpendicular shaft placed in the center of this circular tract. The wheels to be of the size, pattern, and make, as those to be used upon the road for which the rails are to be tested, and the car to be loaded with a weight per wheel equal to the greatest load they will have to sustain upon the road. The vertical shaft to be well braced and strongly attached to the car, so that when a rotary motion is given to the former, this motion will be participated in by the latter—a pulley being placed at the top or bottom of the shaft, for the purpose of revolving it by means of a stationary steam engine. The speed of travel of the wheels to be the same as the average speed required upon the road. The *modus operandi* of the test of rails with this apparatus will be as follows:

"Assuming the average traffic of the line to demand the going and returning of eight daily trains upon the road (or four each way), of 15 eight-wheel cars, then each rail would be ridden over by 480 wheels daily. My testing car being supported by, say, eight wheels, in that case 60 revolutions would be equal to one day's use of the rail. Supposing the circular track to measure 60 feet on its circumference, and the average speed of the trains on the road in question to be 20 miles per hour, or say, 1,800 feet per minute, then it would be necessary to give the revolving car 30 revolutions per minute, to subject the rails to a trial of usage with the same speed. At this rate (60 revolutions of the car being equal to one day's use of the rails) the effect of the wear due to that time will be produced in two minutes. If two minutes are equal to one day's use, then one hour will be equal to that of 30 days, and 12 hours and 10 minutes to that of 365 days, or one year. Or in other words, experimenting during one day, of 12 hours and 10 minutes, will show the effects of a whole year's use of the rail when laid on the road. A rail which begins to laminate in six days, four hours, and six minutes of testing, is sure to do the same in six years, four months, and three days of usage. To obtain the effect of the hammering, crushing and tearing due to the wheels, one or two of the rails should be so bent as to form depressions in the surface of the track, and also be not exactly true in its circular alignment, in order to cause a zig-zag or sideway traction. Thus all the different peculiarities of a railroad can be imitated, and the duration and corresponding value of rails and wheels be determined with great accuracy, because in the trial they are exposed to all the various strains and other elements tending to its destruction in the same combination as they would be when laid upon the road, and were subjected to its regular traffic.

"The contested superiority between pear and square headed, thick and thin headed rails, hollow and solid rails, heavy and light rails, the merit of all kinds of splices, chairs, keys, and bolt-fastenings, and between the great variety of car-wheels will thus soon be determined."

ALL MEN ARE CHEMISTS.

There is no man in the community who has not a considerable portion of that knowledge which constitutes the science of chemistry. Chemistry ascertains the properties of simple substances. Of the sixty-two simple substances at present known, forty-seven are metals. Every man who knows that iron is harder than lead, or that gold is heavier than copper, knows so much chemistry. Lavoisier, who was guilliotined in the French revolution in 1794, was the first who supplied weights systematically to chemistry—the first who began to find out *how much* heavier one substance is than another.

The metals which are the most common—the ones with which the chemist has most to deal—are of course the very ones the properties of which are most widely known. If a man, with the knowledge he already has of the common metals, iron, copper, silver, gold, lead, tin, zinc, mercury, antimony, and arsenic, will learn the properties of four other substances, he will know more than half of all that is embraced in the science of chemistry. These four elementary substances make up almost the whole of our bodies, and of the bodies of all animals, as well as of all trees and plants; they compose the air and the water. We burn them for fuel and for light, we eat them, and drink them, and wear them. They are the most common substances in nature. Their names are oxygen, hydrogen, nitrogen, and carbon.

A COLUMN OF INTERESTING VARIETIES.

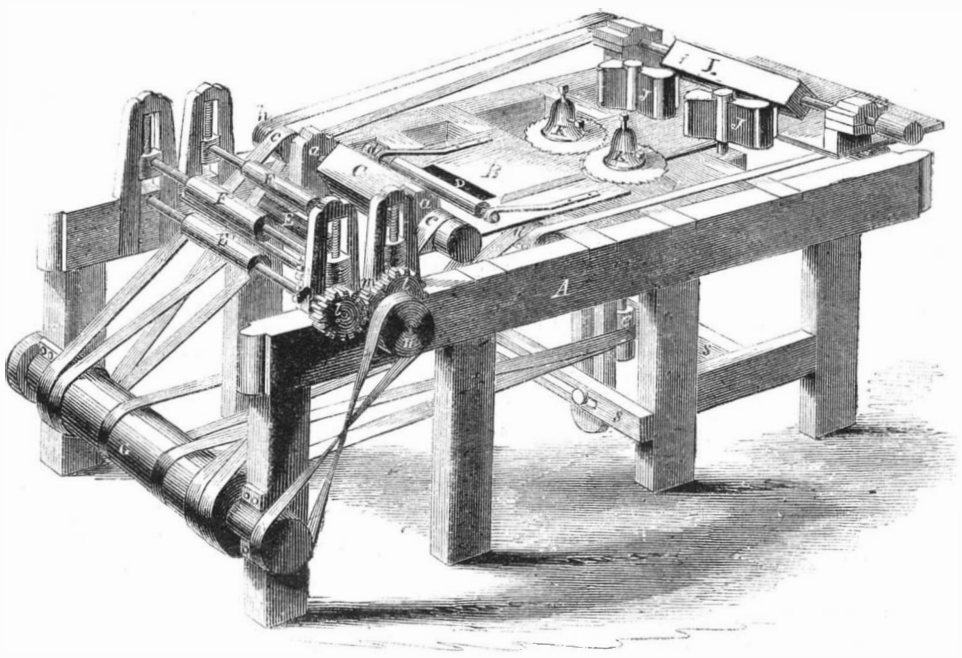
Warfare in the days of Cæsar, was no mere child's play. In nine years he had conquered 300 tribes, 800 cities, slain a million of men, and taken a million prisoners. After he had become master of the world, he entertained the whole Roman populace, at 23,000 tables, furnished with every luxury. He made an artificial lake, for the purpose of showing the assemblage a sample of naval warfare.....Australia is of almost exactly the same extent as the United States, including the territories.....When Lavoisier, who has been called the father of modern chemistry, was arrested, by order of the Committee of Public Safety, during the "reign of terror" of the French Revolution, he asked for a fortnight's lifetime to finish some experiments. The reply was, "The Republic does not need them;" and his head was cut off by the guillotine. He was accused of fraud in his office of Farmer-general.....Plumbago and charcoal are composed of the same substance, carbon; but, while charcoal is very combustible, plumbago is used for making retorts to resist an intense heat.....Observations on the comets, especially on the last brilliant one, which appeared a year ago, show that there are properties of matter, at all events of some matter, which are not at all understood.....The great mass of almost all rocks consists of metallic ores, more than half of them being composed of oxygen and some metal.. ...9013 lbs. of water consist of 1000 lbs. of hydrogen and 8013 lbs. of oxygen.....The stars, sun and moon apparently roll around the heavens once in 24 hours; the pivots being the north and south poles of the heavens; the north pole is very near the north star.....Astronomy is the oldest of the sciences; it was first studied by shepherds, while watching their flocks at night.....It is said that turbine water-wheels have been constructed which, from actual measurement, yield more than 90 per cent. of the power, a result which has never been equalled by any breast-wheel.....Some of the comets, while at the greatest distance from the sun, do not move as fast as a man can walk.....In this latitude, men, with their houses and farms, are carried along by the rotary motion of the earth, just about as fast as a cannon ball moves, while the revolution of the earth around the sun carries us all with a velocity more than sixty times that of a cannon ball.....Pure clay is the ore of the new metal aluminium.....The Aurora Borealis is one of the things about which hardly anything is known; the recent display caused, as usual, perturbations in the magnetic needle, and in the workings of the telegraphs. .....Some of the latest inventions in the steam-engine, made by our most profound philosophical mechanicians, are efforts to utilize one form of it which was known before the Christian era.....The recent balloon ascensions seem to confirm the probability of there being a current of air at the height of 10,000 feet, blowing constantly from the west towards the east; the top of Mount Washington reaches into the lower edge of this current, and generally feels its effects.....Arago, the great French astronomer, expressed a regret that the observatory of Paris contained no telescope equal to the magnificent refractors of Washington and Cambridge, in the United States.....The largest steam-engine afloat, is the one on the *Metropolis*, which plies between New York and Fall River, Mass.; it is larger even than those upon any of our steamships.....If a model of the universe were constructed on a scale of 10,000,000 miles to an inch, (so that the sun should become a shot .08 of an inch in diameter, and the earth's orbit be 19 inches in diameter,) the nearest fixed stars would still be 30 miles distant.....Comparative anatomy illustrates forcibly the uniformity of the works of nature. We were walking on the shore of Staten Island with a gentleman who had paid some attention to this science, and observing a little bone on the beach, we asked him if he could tell to what animal it belonged. He looked at it without picking it up, and replied, "Yes, that is the inside lower bone of the right fore-leg of a dog." Agassiz made a drawing of a fish from a single scale, and afterwards, when the fish was found, the drawing proved to be a very good likeness..... Cypresses are known to be 800 or 900 years old. They rise 120 feet, and are from 25 to 40 feet round. Strabo speaks of one in Persia 2,500 years old.....At different times, quite a number of new stars have appeared in the sky, and, after blazing a while with great brightness, have ceased to be visible.....An animal which does not reach across the wire of a pin appears, under a microscope of high power, more than an inch and-a-half in length.

IMPROVED RE-SAWING MACHINE.

The frame, A, of this machine has a stationary bed, B, on the top of the main frame, and in a suitable place there is a rotary planer or cutter, C, having its bearings in two boxes, *a a*. There is an opening in B, in which another rotary cutter, D, is placed, and the "stuff" is fed to the cutters by the feed-rollers, E F, the roller, F, being capable of a vertical movement to accommodate the thickness of the stuff. The main driving-shaft, G, is placed in a convenient position, and by belts *c d* and *h*, motion is communicated to the upper operating parts of the machine; and belts from it also communicate motion to the pulleys, *e*, on the shafts of the vertical cutters in the machine, which are the saws, K, and cutters, J; I being a cutter operated by *h* at the back of the machine, and there is a cutter that operates through a groove in the frame like D at the back of I. The saws can be moved inwards or outwards, and the cutters, J, can also be adjusted by having their lower bearings attached to pieces that are connected with the slotted cross-trees, *s*. The feed-rollers receive motion through the gear wheels, *l l*, and the gear wheel, *m*, upon the same shaft as the wheel, *n*, that is operated by a belt from G. The plank is passed through the feed-rollers and through the first cutters, where it is smoothed off on both sides (the saws tongue and groove for flooring or ceiling, and the cutters, J, serve as jointers or matchers) and bring the stuff to the same breadth throughout its length. The cutter, I, and the cutter behind it may be used with either or both of them, as circumstances may require, for the purpose of bending or sticking moldings, or finishing strips for gothic houses. When the saws are used for re-sawing, the two saws enable them to be used thinner than one, and thus save power and wood. They can be placed at an angle to give a bevel to the edge of the stuff, as also can the cutters, J. From the manner in which the saws are arranged, there is no loss of time from filing the saws; but one, when dull, can be easily removed, and another, a sharp one, substituted in its place.

This machine is simple, cannot easily get out of order, and will do a large quantity of work, in a very superior manner. It commends itself especially to all who work on wood, or build structures with that material. The inventor, A. C. Ross, of Almont, Mich., will be happy to give any information concerning the invention. The patent is dated May 31, 1859.

ROSS' RE-SAWING MACHINE.

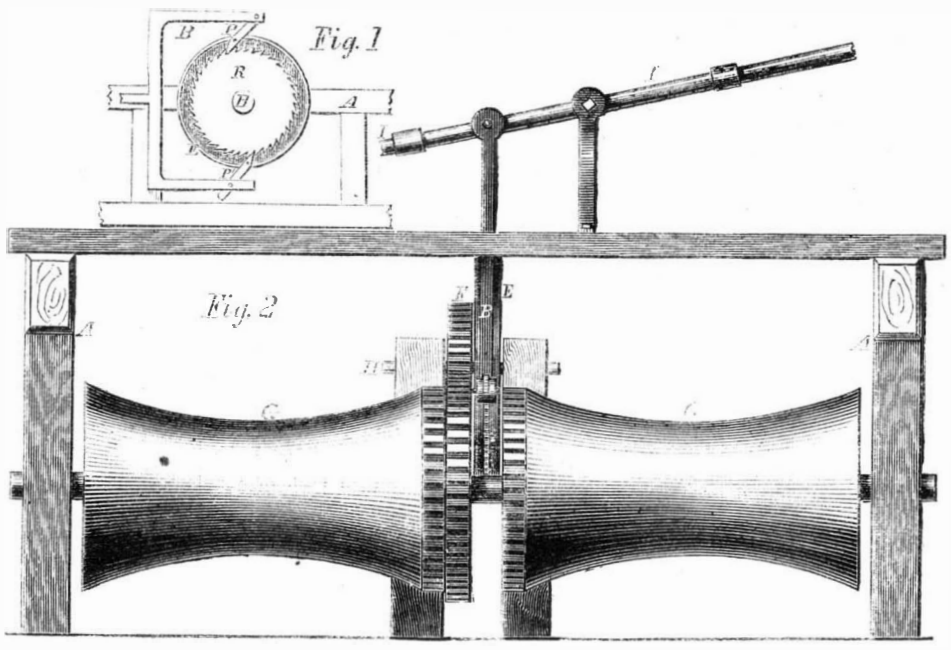


IMITATING MARBLE.

Variegated marble may be imitated in all the rich colored veins for which some species of it are distinguished. For this purpose a polished block of marble to be treated is first warmed in an appropriate oven to open its pores, after which the colors are applied. These consist of an alcoholic solution of alkanet root, to produce a rich lavender, a madder lake to make a crimson, indigo to produce a blue, verdigris green and gamboge yellow. They are put on according to the fancy and taste of the artist, so as to form the desired pattern, after which the marble is again raised in temperature to make it absorb the colors, then cooled gradually and afterwards rubbed down to a smooth face with pumice stone and water. The principle of operation is similar to that of staining wood to imitate the rich qualities of mahogany, walnut, satin and rosewood.

IMPROVED ROTARY MOVEMENT.

There are many devices for changing reciprocating into rotary motion, some very complicated and some very simple. To the latter class belongs the subject of our illustration which shows the invention of W. Howard Mitchell, of San Francisco, Cal.



MITCHELLS' ROTARY MOVEMENT.

Fig. 1 is a diagram of all the parts of the invention. A is a frame across which a shaft, H, is placed, carrying a ratchet wheel, R, that is provided with a flanged casing, E, on each side. Between these flanges, on each side of the periphery of the ratchet wheel, are two inclined reversed pawls or catcher, P and P′, jointed to the flanges by pins, and also attached to two horizontally-moving arms, B, which are connected at the back, and both move simultaneously and together. The power is applied to these arms, and as the pawls are continually coming in contact with the teeth of the wheel in reverse directions, the reciprocating motion of the bars is changed to a constant rotary one of the wheel, E, and shaft, H. The pawls detach themselves and are not liable to catch, but the whole (judging from the model we have examined) operates smoothly and efficiently.

Fig. 2 shows the invention applied to a windlass, A, being the framing, and B, the arms; on the shaft, H, a cog wheel, F, is placed, and this geers with another cog wheel on the shaft of the drums of the windlass, G. It can be rotated by the up-and-down motion of the levers, I, which may be of any length and the power of the windlass proportionally increased. For ships' use the invention as will be seen is very compact and easily operated, and can be operated the same whether the arms, B, are in a vertical, horizontal or inclined position.

The patent is dated Aug. 16, 1857, and the inventor may be addressed for further information at No. 27 Bleecker-street, New York City.

SUGGESTIONS TO INVENTORS.—A correspondent, writing from Belleville, Ind., who has had good success as an inventor, sends us a letter of suggestions to inventors in regard to the best mode of proceeding when they wish to effect any particular improvement. Two of these suggestions are valuable. The first is to keep alive a large faith in the resources of invention. In regard to this point, the writer's says that, "fifty years ago, my father remarked that he thought that he would turn his attention to inventing, but it seemed as if *they had got everything about perfect!*" Since that time every art has been revolutionized by inventions; and, as the number is increasing every year, there is no doubt that the next 50 years will see a much greater advance in improvement than even the last 50. The second suggestion is, that inventors, before spending time or money, should ascertain what has already been done in the matter under consideration. This is important. One of the most curious among the many curious things connected with inventions, is the great number of times that the same thing is invented, over and over again, by different minds. Men make costly models, sometimes still more costly experiments, and then learn that the same field has been gone over before.

EXAMINATION OF INVENTIONS.—It is important for inventors, so far as possible, to determine upon the probable novelty of their inventions previous to incurring the expense of an application for a patent. Messrs. MUNN & CO., publishers of this journal, are able to offer the best possible facilities for this purpose. United to their own experience of fourteen years in the examination of inventions, they make preliminary examinations (through their branch office in Washington) at the Patent Office, into the novelty of supposed improvements, for which service a fee of $5 is charged. For an opinion without this Patent Office research, no charge is made. All they need is a plain pencil sketch and description.

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VOL. I., NO. 11.....[NEW SERIES.].....*Fifteenth Year*

NEW YORK, SATURDAY, SEPTEMBER 10, 1859.

CITY RAILROAD IMPROVEMENTS.

IMPROVEMENTS for propelling cars upon city railroads seem to be imperatively demanded. On the several lines in New York, Philadelphia, and other cities, all the cars are either drawn by horses or mules, and each company requires a horde of these animals to do the necesary work. As their sinews can only be kept in motion for a very limited period of time, a great number of relay teams must always be maintained, thus involving a vast expenditure. The proprietors of these lines would gladly avail themselves of a more economical substitute for animal power, and it is to this new field for improvement we wish to direct public attention by some brief considerations.

To show how anxious some of these railroad companies in New York are to obtain a new motive agency, we have only to state that one of them has been engaged for some months in making experiments and efforts to apply a spring-power to one of their cars. It consists in the application of coiled springs to the axles, which are operated by such an arrangement that they exert their tension force when uncoiling to revolve the wheels; and while one spring is actuating an axle, the other is being wound-up for keeping the car in motion. It has been asserted that, with the labor of one man for coiling up the springs, a car can be moved as easily as with two horses. Such an expectation is preposterous, because no more power can be exerted by the springs than that which is applied to coil them. This project, however, affords good evidence of the readiness with which a new substitute for horses is taken up, for the purpose of abolishing their employment entirely. We commend the spirit of the company which has been making these efforts; because a spring-power, even if it were more expensive than that of animals, is preferable, for much cruelty to the dumb brutes would thereby be abolished.

We have also noticed that a peculiar class of steam-engines has been proposed in the columns of our Philadelphia cotemporaries, by Mr. Thomas E. McNeil, whose proposition has been highly commended. The engine is described as direct-acting, with horizontal cylinders, a vertical boiler, and a condenser to obviate the noise of the exhaust blast in the chimney. The *Ledger* states that "it is designed to box up the machine so as to present the appearance of an ordinary car, with a small chimney like a stove-pipe. Built upon the plan proposed, the engine will occupy about the same space as the horses. The cars can be heated by steam in the winter, and cooled by a fan in the summer. Another advantage claimed for steam over horses is, that there will not be any dust, and that it can be more easily managed, the cars being stopped in less time. The engine can be applied to the cars now in use, and will, with ease, ascend any of the grades in the city. It is claimed that, on the score of economy, steam has a decided advantage over horses, costing from one-third to one-half less." Such engines may operate very well, but they are not new, although we have no doubt they are original with the inventor who now proposes them. Several years ago either one or two of such engines were constructed by Mr. Henry Waterman, of Brooklyn, at Matteawan, N. Y., for the Hudson River Railroad Company, to draw their cars through this city, and they were described in one of our former volumes. It was stated that they fulfilled all the conditions for which they were engaged, but for some reason (unknown to us) they were only used for a very brief period.

There is a strong prejudice existing in the minds of our citizens against the use of steam-engines running in the streets; hence not only the city railroads proper, but all lines which converge here (and it is the same in other cities), have to unharness their iron horses at the corporation precincts, and use animals to perform the rest of the journey. The vast extra expense incurred by this mixed system of railroad conveyance stamps it at once as being either behind the intelligence or the engineering skill of the age. For our own part, we know that steam locomotives can be constructed to operate with as much safety and with far more economy than horses in drawing city cars, and the popular prejudice against them we hold to be groundless. An engine with a tubular boiler six feet long and three feet in diameter, carrying 50 lbs. of steam, with cylinders only six inches in diameter and ten inches in stroke—making 200 revolutions per minute—will do as much work as five horses, and occupy no more room in the street than one animal. It can be as easily controlled as an infant, and a very limited number of such motors could supply the place of a great number of horses, because iron sinews "never tire" like those of animals; hence a crowd of relays would not be required. Turn-tables at the ends of the tracks can be set in the ground for turning round, and every arrangement necessary for perfect operation can be provided to insure success. We, however, do not propose any specific plan, but we perceive that some new improvement is wanted as a substitute for the whole of this animal barbarism on city railroads; and that either steam, hot air or electro-magnetic motors are preferable. This is a question which should and must be agitated until a complete reform is achieved.

INDIA-RUBBER INTERESTS OF THE UNITED STATES.

With this number of the SCIENTIFIC AMERICAN we publish an elaborate illustrated description of one of the great india-rubber manufacturing companies of the country—the "New York Belting and Packing Company;" also some details of the life and discoveries of the inventor of vulcanized rubber, Charles Goodyear. The warehouse of this company is at Nos. 37 and 38 Park-row, next door to the entrance of the SCIENTIFIC AMERICAN office. A visit to this warehouse must impress any one with astonishment at the wonderful growth of this comparatively new manufacture. Here is to be seen a varied assortment of the three staples of the company's manufacture—Belting, Packing and Hose; belts from one inch to 36 inches in width, and of any length and thickness desired; packing from 1-32 of an inch to two inches in thickness, and of numerous forms, for manhole and hand-hole plates, steam-chests, steam valves for marine and other engines, stuffing-boxes, &c., &c.; hose from a half inch to four inches in diameter, and in thickness from the thin two-ply up to the six-ply for steam fire-engines, which is subjected to a strain that no leather will sustain.

The company inform us that these articles have already gone into use to a surprising extent; that some of the leading manufacturers of threshing machines use 50,000 feet of belting a year; that nearly 300,000 feet (more than 50 miles) of belting are used in a year for cotton gins; and that the rubber hose is now in general use throughout the country, upon hydrants, force-pumps, steam fire-engines, &c.

One curious article of manufacture, in contrast with this company's staples, is Phelan's patent cushion for billiard tables. These are made soft at the back and hard on the edge, so as to cause the ball to rebound at the proper angle.

We remember the time when all the india-rubber that we knew anything about consisted of the little pieces with which we erased pencil marks: and now its manufacture is a vast interest, woven in a thousand ways into the life and business of the people. When we contemplate a growth so marvelous, we wonder what new manufactures and arts, at present undreamed of, the next 40 years of this country will develop.

In our next week's issue we shall take up, briefly, the subject of *hard* rubber, and enumerat the multifarious arts to which it is now applied.

THE ELECTRIC ART APPLIED TO PRINTING.

After a successful publication of the SCIENTIFIC AMERICAN for 14 years, we commenced a new series on the first of July last, having every number electrotyped, so that, in future years, back numbers and volumes might be supplied. After we began to publish the new series, the increased demand so far surpassed our own expectations that, before the eighth issue appeared, we had to furnish two extra editions of several preceding numbers. When the art of electrotyping was first so far improved as to come into practical use, we published a series of interesting articles on the subject. Little did we expect, however, at the time, ever to be benefited by this beautiful art in our business. This paper is now regularly printed from the copper-plates of the electrotyper; and while one number is in process of being printed, the types from which the mold was taken are in the hands of the compositors, in preparation for the next impression. Thus, week after week, the matter is set up and electrotyped, the paper printed, folded, put in wrappers and mailed, giving employment, in these departments alone, to more than 30 persons.

In England, and on the continent of Europe, there are a number of monthly publications devoted to mechanics, inventions and science; but there are not, in all Europe, six weekly papers of this character, and the subscription price of those that are published, owing to their limited circulation, is more than three times the cost of the SCIENTIFIC AMERICAN. Will all who take an interest in the history and progress of mechanism, science, or invention, consider (if they are not already among our subscribers) how cheaply they can procure a weekly journal devoted to these subjects, and, if they are satisfied that it will be a good investment, send us $2.00 for a years' subscription? The numbers for a year contain over 830 pages, and more than 600 original engravings of new inventions and machines, all made expressly for this paper. At the end of every six months, an index and title-page are furnished, so as to make the work complete for binding. We do say, without fear of contradiction, that no other work containing so large an amount of valuable and interesting information, can be purchased at the same cost.

In the prospectus, on the last page of this paper, the character of the publication is fully set forth, and the terms, for single subscribers and for clubs, are given in detail. To this prospectus we respectfully call the attention of those readers of the present number who may chance to fall in with it, who are not our regular patrons.

CROWDED STREETS.—We often justly complain of the overcrowded state of the principal business streets in our city, especially Broadway; and to obviate this evil, suspension railroads and subterranean railroads have been proposed by several inventors, many plans of which have been illustrated in our columns. The police do their best to prevent obstruction to constant travel; but, in spite of all their efforts, carts, carriages and stages frequently get blocked up in such solid ranks that they cannot pass one another for long intervals of time. We think that things must be managed in a rather superior manner by the London police, or it would be impossible for the vast number of vehicles which crowd into that city to pass over the bridges. From a report recently published, we learn that 20,498 vehicles and 107,000 foot passengers pass over London bridge every 24 hours.

AN APPRECIATING PATRON.—In our advertising columns appears an advertisement for a single volume of the SCIENTIFIC AMERICAN, for which the advertiser offers *ten dollars*. We hope there are none of our readers who are inclined to dispose of their volumes at even ten dollars each, but if there be any such who possess Vol. I, we trust they will address Mr. Nessle, at Albany, N. Y. We would take occasion to remark in connection with the above, that the price now offered for a single year's numbers of the SCIENTIFIC AMERICAN would pay, at our club prices, for seven years' subscription in advance, thus proving that, in a pecuniary sense, an investment in the SCIENTIFIC AMERICAN is "better than investing in a savings-bank," as our correspondent, J. R. G., of Louisville, Ky., testifies by relating a pleasant incident in our last week's issue.

BRILLIANT ATMOSPHERIC PHENOMENA.

On Sunday evening, the 26th ult., the heavens were adorned for several hours with the most gorgeous drapery. Soon after sun-set, "the merry dancers" of the Scottish peasantry ventured from their homes in the North, and swept, with lightsome feet, far over into the southern hemisphere. As the twilight deepened, their brilliant and many-colored lights radiated from a focus, like a star in the center of a glittering canopy, and extended over the entire dome above. The play of colors, and the rapid motions of the streamers, were beautiful beyond the power of pen to describe. Now they would be of a deep yellow color; then instantly change into blue; and again into purple, crimson, green and lilac; and, at other times, the whole of the prismatic colors, like flaming arrows, were launched from the celestial bow.

Mr. Merriam, of Brooklyn, in giving an account of these appearances, says:—

"The auroral light sometimes is composed of threads like the silken warp of a web; these sometimes become broken and fall to the earth, and possess exquisite softness and a silver lustre, and I denominate these as the products of the silkery of the skies. *I once obtained a small piece, which I preserved.*"

This is an entirely new idea to us, and we think that some other substance must have been picked up in a mistake for the product of the auroral loom. It is very seldom that such phenomena are witnessed here; and especially at this season of the year. They are common in the Arctic regions, and are, no doubt, due to the flashing of electricity through air more or less rarified at variable hights above the surface of the earth. The telegraph wires on all our lines were greatly affected with the atmospheric movements, and this corroborates the views which men of science entertain regarding their cause. The aurora can be imitated, on a limited scale, by discharging electricity from a pointed conductor into an exhausted glass receiver. Two rarified currents of air—one from the north-west, the other from the south-east—according to our observations, met on the evening referred to, and caused the phenomena by the discharge of their electricity. Another very brilliant aurora was witnessed on the morning of the 2d inst.

REMARKABLE PATENT CASE.

A trial recently took place in the Scottish Court of Sessions, the like of which, as connected with a patented invention, was never known before. The plaintiff was Mr. A. O'Regan, of Liverpool, the defendants were Messrs. Tod & Higginbotham, extensive calico printers in Glasgow. They had accepted the plaintiff's proposal to supply them with a number of his smoke prevention furnaces, and the apparatus was duly supplied and fitted up. In course of time, the defendants, as they now aver, discovered that the plaintiff's patent was invalid, and they then refused to pay for the furnaces. To enforce payment, the plaintiff brought an action in the Sheriff's Court at Glasgow, to recover the sum of £450 as agreed upon. The defendants on the other hand, brought an action in the Court of Session, for the purpose of having the patent declared invalid and annulling their contract.

In giving judgment, the Lord President stated that the case was peculiar. He had never before heard of a patent being assailed by the purchaser of a patented article, and it would be a strange thing to hold a patentee liable to be assailed by every one who purchases his articles and chooses to pick holes in his patent. There was no allegation of fraud in this case, no allegation even that O'Regan knew that his patent was invalid. All that is said is, that he knew that it had been "publicly challenged." It might have been challenged. It might have been challenged on the weakest and silliest grounds possible. The case looked like one of inexcusable negligence on the part of the contractors. They ought to have satisfied themselves of the character of the articles they were contracting for. Even now they do not seek to reject the articles. They did not do so as soon as they knew that his patent was invalid, as they allege, from prior use, defective specification, &c., but they retain them, and desire the Court to fix a reasonable price for the furnaces on the footing that the patent is invalid—to reduce the price from £450 to about £70. As to the account, the case being reported on issues, it must go back to the Lord Ordinary; but he was of opinion that there was no issuable matter on record. The others concurred, Lord Deas remarking that he did not think that by every patented article a man sold he made himself a new enemy, and that he considered this contract a contract of sale and not of work. The Court refused to allow the issues, with expenses.

In regard to this case, the *Practical Mechanic's Journal* says:—

"We have known many very curious grounds for actions on patents, but we certainly never heard of any so extraordinary as in this case. Here is a patentee who makes a bargain to erect certain furnaces at a cost of £450. That was his price, and patent or no patent, he had plainly the right to recover the amount, if he really fulfilled his contract, and it is not denied that he did so. The defendants assuming that there was virtually no patent, sought in the face of their bargain to get the contract sum reduced, as we suppose, to what they considered the furnaces could be erected for. In this procedure, the defendants must evidently have been most erroneously advised, for a bargain had been entered into for the execution of certain work, such bargain being really independent of any patent. It is therefore no answer to turn around and tell the patentee that the payment formally contracted for could not be made, for the reason that the patent was alleged to be invalid. We give no opinions upon the merits of the invention, or upon the novelty or otherwise of the patent, for neither of these points is in question. It is, however, satisfactory to find, that the Lord President decided as he did, for were it otherwise, and were such a decision to become law, no patentee would be safe."

HOW TO TELL THE CHARACTER OF PAST SEASONS.

Two correspondents have directed our attention to a meteorological article recently published in the *Zeitung*, at Galveston, Texas, from which it appears that the people in some part of Texas have lately been visited with a series of five dry seasons, which have greatly discouraged the farmers, and an opinion seems to have gained some prominence, that the climate has changed, and that for want of rains the country would become unproductive and barren. In previous years an abundance of rains and moisture had been furnished to produce the most luxuriant crops; but the late dry years had led many persons to regard the former favorable seasons as the exceptions and the late barren ones as the rule. The article to which we have been referred settles this question in a most satisfactory manner by a very ingenious theory laid down and tested by its author, J. Kuechler, of Gillespie county. He states that the records of Texas are of two recent date in regard to past seasons, to form a correct opinion of their general character, whether they are more often very dry or wet; and going to nature as the most uncompromising and correct witness for testimony, he says:—

"A tree bears its own history written in itself, and this is most intimately connected with the yearly fall of rain. Water is a main element in the development of plants; without it, their growth is impossible. With a sufficiency of moisture they arrive at their maximum of growth; that wanting the growth is relatively retarded. We can accurately follow the growth of a tree from its earliest state to its present perfect condition. We trace its yearly growth by annual rings, whose size mainly depends upon—the supply of water, so that the broad rings indicate wet years, and the thin rings, which can scarcely be distinguished by the naked eye, denote dry ones. This theory should govern our researches into the past. Great care is necessary in the selection of trees for this experiment. We may be misled by trees upon which abnormal conditions have been developed. In my experiments I demanded two requisites: first, a high, isolated position, so that the drouth has an early effect upon the trees and secondly, sound, healthy trees. I felled three post-oaks—two somewhat over 130 years old. I took from each at the thick end, a vertical section, planed the surface very smooth and then varnished it over, which made the annual rings distinctly visible (fat has the same effect), and I prepared from each section a table of the relative order and position of those rings. Upon comparing these three tables, they were found to correspond exactly—a proof that moisture is the only cause of this difference in the size of these annual rings."

His tables of these rings go back to 1725, and from the size of each ring he judges whether the season in which it was formed was dry or moist; the small rings being set down for the dry and the larger ones for the moist seasons. By this test there have been 67 wet summers during the past 133 years, in western Texas, and the rest of the years are divided into dry, very dry, and average seasons.

ACTION OF WATER ON LEAD PIPES.

An essay has been published in the Edinburgh *New Philosophical Journal*, by Dr. Lauder Lindsay, in which he promulgates opinions totally opposed to those generally entertained by chemists regarding the action of water on lead pipes. It is generally taught and believed that pure soft water acts rapidly on lead, and converts it into an oxyd when exposed to the atmosphere. On the other hand, it is as generally taught and believed that hard water, which contains neutral salts in solution, does not become impregnated with lead in passing through pipes—the pure water is held to be dangerous to use with lead pipes, while the impure water is considered safe. It is believed that the neutral salts in the water prevent it acting upon the lead, while the oxygen of the pure water has such an affinity for the metal that it leaves its hydrogen and acts chemically upon it. Dr. Lindsay asserts that observation and experiment have led him to conclude that certain pure soft waters do not act upon lead; while certain hard waters, which are regarded as most protective, do act chemically upon it, and therefore it must be dangerous to use for conveying such water for domestic purposes. He has tried experiments on a large scale, and from these he has drawn his conclusions. He asserts that those before him who have made investigations on a small scale have been deceived as to the results, and that water containing a small portion of lead will affect some members of a family, or of a community, and not others, and that the *rationale* of this is not well understood. From what he says, the only safe course to pursue in the matter is not to use such pipes at all. This is a question of vast importance, as miles upon miles in length of leadpipe are used in our cities and villages, for conveying water. We know that this has been a frequent topic of discussion among *savans*, but they have rather "sheathed their swords for lack of argument" than positively settled the mooted points.

FIRES.—SPONTANEOUS COMBUSTION.—A great number of fires have recently taken place in various parts of our country, and in most instances they seem to have had some connection with materials containing oil or grease. Thus there was a destructive conflagration last week among the oil stores in New Bedford, Mass., and on the night of the 30th ult., the very large rope-works of Messrs. Waterbury, in Brooklyn, N. Y., were nearly all consumed, involving a loss of about $100,000, as reported. In this latter case, the fire originated in the jenny or spinning room, where no fire was kept, and among some idle machines, on which were piled some hemp and matting. There are some qualities of hemp which require to be treated with an "unformed soap," consisting of an alkaline liquid and oil, and both cotton and hemp, so treated, are very liable to spontaneous combustion. We have seen quite a number of instances of this kind in our life-time, and in all likelihood this was the immediate cause of this fire.

FACTORY SCHOOLS.—In many of the large manufacturing establishments in England and Scotland, schools are maintained at the expense of the manufacturers for the operatives in their employ; and their hours of study are so arranged that, while earning their own living wholly or in part, they can, at the same time, secure an education. In our cities, we secure the same results, in a measure, by night-schools; but as these are only supported during the winter months, of course they are not so efficient as the factory schools in England.

NEW INVENTIONS.

IMPROVEMENT IN SKATES.—Asa Wheeler, of Brattleboro', Windham county, Vt., has invented an improvement in fastening the skate to the boot or shoe, and tightening the same thereto after the skate has been strapped to the foot. The invention consists in making the heel part of the stock longitudinally adjustible by a thumb-screw, which passes through the heel and into the fore part of the stock, so that, after the ankle-strap and instep-strap have been buckled tightly on the foot, the skate is further tightened by the set-screw.

IMPROVED MACHINE FOR PICKING MILL-STONES.—This invention relates to an improved machine for picking mill-stones, and is of that class which are operated automatically by the rotation of the spindle of the stone, or by the rotation of any shaft or arbor placed concentrically therewith. The object of the invention is to obtain a machine by which the force of the blow of the pick may be graduated, as occasion may require, with the greatest facility, and the spring which actuates the pick, or gives it its blow, prevented from re-acting on the machine. The invention also has for its object a ready adaptation to stones of varying sizes. The inventor is J. R. D. Nesmith, of Franklin, Merrimac county, N. H.

MACHINE FOR MANUFACTURING HAT BODIES.—The object of this invention is to obtain a machine by which hat bodies may be manufactured at one operation, and with one and the same machine; or, in other words, to combine the processes of "forming" and "hardening" the bodies so that both will be performed simultaneously, thereby greatly expediting the manufacture of hat bodies, and materially reducing the expense attending the same. The invention consists, in using in connection with the ordinary perforated cone or former, suction blast and any suitable fur-distributing contrivance; a "hardening" device, formed of a suitable cloth, so arranged as to act upon the fur during the "forming" process, with a compound movement, and subject the same to the necessary friction or rubbing, and, in connection with the suction blast, to a requisite degree of pressure, whereby the desired object is attained. The inventor is Seth Boyden, of Newark, N. J.

IMPROVED SHINGLE MACHINE.—This invention relates to an improvement in that class of shingle machines in which a circular saw is used for sawing the shingles from the bolts, and tilting beds employed for adjusting the bolts relatively with the saw, so that the latter may cut the shingles from the bolts in proper taper form. The invention consists in the employment or use of a reciprocating bolt-carriage, in connection with sliding jaws, arranged relatively with a circular saw and tilting beds, whereby the bolts are properly adjusted and fed automatically to the saw. The invention also consists in the employment or use of a bolt-elevating device placed in the reciprocating bolt-carriage, and so arranged as to elevate the bolts during their return movement over the saw. The invention further consists in the peculiar means employed for conveying the shingles from underneath the saw and bolt-carriage, and discharging them from the machine. Nathaniel Waterbury, of Fond du Lac, Wis., is the inventor.

CORDING-ATTACHMENT FOR SEWING-MACHINES.—This useful contrivance is the best we have seen for the purpose, serving to insert a cord either close to or at any distance from the edge of a piece of work, and to perform the cording in any number of parallel rows, as close together as may be desired, and in the most even manner possible. It consists simply or a plate, arranged flat upon the cloth-plate of the sewing-machine, and provided with a grooved edge and guiding-eyes for the cord to pass through from a spool. The inventor is A. Golay, of Mobile, Ala.

FOREIGN SUMMARY—METALS AND MARKETS.

A large locomotive for one of the Canadian railroads has just been built by Messrs. Walter Neilson & Co., of Glasgow, and it is in every respect a faithful copy of the wood-burning engines built by Baldwin, of Philadelphia. It has the cow-catcher, spark-arrester and engineer's house, which are left out of ordinary British engines. The English "engine-drivers," as they are improperly called, stand out upon a platform uncovered, and thus exposed to all the changes of the weather, and a gale of wind equal to the speed of the train continually in their faces. For years past, they have solicited to be sheltered like the American engineers; but thus far no railway company has responded to the reasonable requests of these noble fellows.

The London builders are still out on strike, and some of the operatives and their employers have had a sharp newspaper controversy. It was charged against the workmen that they were opposed to the use of machinery by the master-builders. This they have denied in a letter signed by the officers of their con-associations. They say: "We seek an equivalent in the diminution of the hours of labor, because machinery, by its rapid growth, and the facility with which it can be applied to every species of productive labor, is fast destroying the necessity for manual labor. To attempt to arrest the onward march of machinery, we know, would be madness, and productive of no good results." The shoe-makers of Stafford, who struck against sewing-machines, have gone back to work. They have received a little advance in wages, but no voice is now raised against the machines.

There has been a very great drouth in Great Britain and Ireland, which is something very unusual, as great quantities of rain fall monthly, owing to the country being surrounded with water. Great complaints are being made by the manufacturers who have mills on the streams and rivers, because these have become so low they cannot conduct their business. They also assert that, since the farmers have resorted to draining their lands so extensively, the streams have become much lower during summer, and they give good reasons for this result. The drains carry off the rains so rapidly after they fall that no constant supply is left in the soil for spells of dry weather.

The hardware and cutlery exported during the first six months of the year from England, show a large increase over the exports in the same period of 1858. Their total value this year is £1,839,648; the increase has been £37,409 ($187,045).

The population of Egypt, according to a recent census, is 5,125,000. Alexandria has a population of 400,000; its inhabitants have doubled in 40 years.

The report of the Commissioners of Patents for the past year has just been published. The number of applications made for provisional protection was 3,007; the number of patents issued, 1,954, or 37 weekly—quite a large list, indeed. This affords very good evidence of the value of patent property in England.

A proposal has been made on behalf of Mr. Lever to charter the *Great Eastern* for a voyage out and home from some safe port in Great Britain to some safe port in North America. The terms offered are £20,000; the vessel to be provided with accommodations for 2,000 passengers, and to steam 14 knots an hour on her trial trip.

PRICES OF FOREIGN METALS, AUGUST 21.

	£	s.	d.		£	s.	d.
Iron, English Bar and Bolt:—				Iron, Swedish, bars, per tun	13	0	0
In London, per tun.	7	0	0	Russian C C N D.	17	0	0
In Wales	6	0	0	Steel, Swedish Keg, nom	20	10	0
In Liverpool	6	10	0	Do. Rolled	20	10	0
Staffordshire Bars.	8	0	0	Faggot	21	19	0
Sheet, single,	9	10	0	Spelter	21	0	0
Double	11	0	0	Zinc, in sheets.	28	10	0
Hoop	9	0	0	Copper, Tile	102	10	0
Rod, round	8	0	0	Tough Cake	102	10	0
Nail Rod, square	9	0	0	Sheathing & Bolts, per lb.	—	—	11¾
Shipping Iron:—				Sheet	—	—	11⅞
Staffordshire Bars.	8	0	0	Bottoms	—	—	12
Sheet, single	9	10	0	Old	—	—	10
Double	11	0	0	Yellow Metal	—	—	9½
Hoop	9	0	0	Lead, British Pig	22	15	0
Rod, round	8	0	0	Spanish	22	10	0
Nail Rod, square	9	0	0	Sheet	23	10	0
Iron, Rails, in Wales, cash	6	5	0	Tin, English Block, nom	138	0	0
Do. 6 months	6	10	0	Bar	139	0	0
In Staffordshire	7	0	0	Refined	145	0	0
Railway Chairs, in Wales	4	5	0	Foreign Banca	146	0	0
In Clyde	4	5	0	Straits	143	0	0
Pig No. 1, in Clyde	2	12	6	Tin Plates, Charcoal, IC, per box	1	13	0
3-5ths No. 1 and 2-5ths No. 3	2	12	0	Do. IX	1	19	0
Staffordshire Forge Pig, at the works, L. W., nom	3	15	0	Coke, IC	1	5	6
Welsh Forge Pig	—	—	—	Do. IX	1	11	6
Acadian Pig, Charcoal	8	15	0	Canada, Plates, p'r t'n	13	0	0
Scotch Pig, No. 1, in London	3	10	0	Quicksilver, per bottle	7	0	0

Banca tin is held firm at £147. Copper is in tolerably good demand, and shipments of pig-iron from Glasgow have increased.

[The above are prices within three per cent discount, the pound being valued at $4.85.

New York Markets.

COAL.—Anthracite, from $4.50, $4.75, to $5.

CORDAGE.—Manilla, 8¾c. a 8¾c. per lb.

COTTON.—Ordinary Upland, 9¾c. per lb.; Texas, 9¾c.; Middling, 11¾c. to 12¼c.; Middling fair from 12⅞c. to 13¾c.

COPPER.—Lake Superior ingots at 23c. per lb for cash; new sheathing, 26c.; no change, but holders are firm.

FLOUR.—The low grades have somewhat receded in price, and the tendency has been downward. Standard superfine State, $4.20 a a $4.50; standard superfine western, $4.20 a $4.45; extra Wisconsin, $4.50 a $6; extra Illinois, Indiana and Michigan, $4.60 a $6.25; extra Ohio, trade brands, $5.60 a $6.50; extra Genesee, $5.40 a $7; inferior to choice extra Missouri, $4.75 a $7.25; extra Kentucky and Tennessee, $4.85 a $7.25. Southern flour contiues quite plenty and heavy.

HEMP.—American undressed, $140 a $150; dressed from $190 a $210. Jute, $95 a $90. Italian scarce. Russian clean, $210 a $215 Manilla 6¼c. a 6¾c. per lb.

INDIA-RUBBER.—Para, fine, 57½c. a 60c. per lb.; East India, 37c.

INDIGO.—Bengal, $1 a $1.50 per lb.; Manilla, good to prime, 55c. a $1.10; Guatemala, $1 a $1.15.

IRON.—Anthracite pig, $23 a $24 per tun; Scotch, $23 to $24.50; Swedish bar, ordinary sizes, $85 a $87.50; English refined, $53 a $54.50; English common, $43 a $45. Russian sheet, first quality, 11c. a 11¾c. per lb.; English, single, double and treble, 3¾c. a 3⅞c.

LEAD.—Galena, $5.80 per 100 lbs.; German and English refined, $5.70; bar, sheet and pipe, from 6¾c. to 7c.

LEATHER.—Oak slaughter, light, 30c. a 35c. per lb.; Oak, heavy, 32c. a 35c.; Oak, crop, 38c. a 40c.; Hemlock, middle, 24c. a 25c.; Hemlock, light, 23c. a 24c.; Hemlock, heavy, 22c. a 23c. Patent enameled, 16c. a 17c. per foot, light. Sheep, morocco finish, $7.50 a $8.50 per dozen. Calf-skins, oak, 62c. a 65c.; Hemlock, 60c. a 65c.; Belting, oak, 32c. a 34c.; Hemlock, 28c. a 31c.

NAILS.—Cut are quiet but steady at 3c. a 3¼c. per lb. American clinch sell in lots, as wanted, at 5c. a 6c.; wrought foreign, 3c. a 3½c.; American horseshoe, 14¾c.

OILS.—Linseed, city made, 59c. per gallon; whale, bleached spring, 54c. a 56c.; sperm, crude, $1.22 a $1.27; sperm, unbleached spring, $1.35; lard oil, No. 1 winter, 85c, a 90c.; extra refined rosin, 30c. a 40c.; machinery, 50c. a 100c.; camphene, 45c. a 47c.; coal, refined, from $1.12 a $1.50.

RESIN.—Common, $1.77½ per 310 lbs. bbl.: No. 2, &c., $1.80 a $2.12½; No. 1, per 280 lbs. bbl., $2.25 a $3; white, $3.25 a $4.50; pale, $4.50 a $6.25.

SPELTER plates, 5¼c. a 5⅝c. per lb.

STEEL.—English cast, 14c. a 16c. per lb.; German, 7c. a 10c.; American spring, 5c. a 5½c.; American blister, 4½c. a 5¾c.

TALLOW.—American prime, 10¼c. to 10¾c. per lb.

TIN.—Banca, 32¾c. a 33c.; Straits, 32c. ; plates, $7.50 a $9.87½ per box.

TURPENTINE.—Crude, $3.62½ per 280 lbs.; spirits, turpentine, 44½c. per gallon.

ZINC.—Sheets, 7½c. a 8c. per lb.

The foregoing rates indicate the state of the New York markets up to Aug. 31.

ALBANY LUMBER MARKET, AUGUST 31.

During the week there has been a fair demand for all descriptions of lumber, and for clear pines the market has ruled in favor of the buyer. The demand has not been confined to any particular locality, but has been scattered throughout the entire manufacturing country along the coast of New England, New York and New Jersey. We notice foreign orders in market for common pines for shipment to Australia. The stock of lumber in market is ample, and the assortment perfect. For the most part holders are anxious to realize, and we are of the belief that if dealers would embrace the present time they could lay in there fall and winter stock to great advantage. Shippers at Buffalo and Oswego have advised their correspondents here that a speedy advance in canal freights can be looked for, and a letter received yesterday morning from the latter place already announces a "strike" and an advance demanded.

The receipts for the week have been moderate, boats being detained by the low stage of water in the canal. The stock to come forward from Canada and Michigan is still large, and the great bulk of the daily receipts are from this section. From the Chemung county the shipments are moderate, and perhaps are scarcely equal to previous seasons.

The figures for boards and scantling show a falling off compared with the corresponding week of last season, but as the canal week this year does not close till this night, the arrivals of this day more than make up the deficiency.

NEW YORK ASSAY OFFICE.

Statement of business at the United States Assay Office at New York, for the month ending Aug. 30, 1859:

DEPOSITS OF GOLD.

Foreign Coins	$16,000 00	
Foreign Bullion	8,000 00	
United States Bullion	201,000 00	= $225,000 00

DEPOSITS AND PURCHASE OF SILVER.

Foreign Coins	$30,800 00	
Foreign Bullion	10,000 00	
United States Bullion (contained in Gold)	2,000 00	
United States Bullion, (Lake Superior,)	1,200 00	= $44,000 00

TOTAL DEPOSITS.

Payable in Bars	$165,000 00
Payable in Coins	104,000 00
Total	$260,000 00
Gold Bars Stamped	$180,984 73
Transmitted to U. S. Mint for Coinage	42,474 80

ISSUED FROM THE UNITED STATES PATENT OFFICE

FOR THE WEEK ENDING AUGUST 30, 1859.

[Reported Officially for the SCIENTIFIC AMERICAN.]

*** Pamphlets giving full particulars of the mode of applying for patents, size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

25,236.—Edmund Belling, of New York City, for an Improvement in Lozenge Machines:

I claim the combination of a revolving or reciprocating knife with the lower part of a press, and operated simultaneously with the same, in the manner and for the purpose substantially as described.

25,237.—Abraham Andrews and Harrison Kalbach, of Bernville, Pa., for an Improved Horizontal Water Wheel:

We claim the curved concave buckets, having curved or eccentrically formed tops and bottoms, in combination with a spiral waterway or chamber underneath, and arranged within a box, A, substantially as described and represented.

25,238.—Douglas Bly, of Rochester, N. Y., for an Improvement in Artificial Legs:

I claim, first, The combination of the segment of rubber, B, or its equivalent, with the foot, F, and leg, A, in the manner and for the purpose substantially as described.

Second, I claim connecting the foot to the leg, by means of the cord, C, or its equivalent, thereby dispensing with all joints, bolts, hinges, and metal straps, and the friction and noise to which they give rise.

25,239.—J. C. Boyd, of Boston, Mass., for an Improvement in Elastic Hose Tubing:

I claim, as a new article of manufacture, the hose made of flexible tubes, the same consisting of a woven fabric of cotton, hemp, or other fibrous materials lined with or fastened to a layer or sheet of india-rubber, or gutta-percha, or any other waterproof composition, and the whole secured by rivets, substantially as described.

25,240.—Wm. Boyd, of New Orleans, La., for an Improvement in Iron Ties for Cotton Bales:

I claim, in combination with the splits, the use of a key, having wings at each end, to form the lock to the tie, when made and arranged as and for the purpose set forth.

25,241.—Jehu Brainerd and W. H. Burridge, of Cleveland, Ohio, for an Improvement in Tanning:

We claim the improvement in tanning set forth, consisting in the immersion of the skins and hides in a tan liquor made from the digestion of the before-mentioned plants; and the accompanying treatment of the skins and hides, by their immersion in the preparing liquid, the whole process being conducted in the manner set forth, whereby the valuable properties of the plants may be preserved for use; and this we claim, whether the above described tan liquor be used separately, or in connection with other substances containing tannin.

25,242.—Henry Brevoort, of San Francisco, Cal., for an Improvement in Gold Amalgamators:

I claim the drag, having upon its lower surface or shoe the combination of the blocks of rubbing surfaces, o, and channels, i, the two being arranged reciprocally in the manner described.

I also claim combining with a revolving drag, F, a pan, A, whose bottom is inclined, and has the form of a circular trough, as represented in the drawing, so as to collect the mercury in mass.

I also claim combining an amalgamating pan and revolving drag with a galvanic battery, arranged in such manner that its poles are extended into the mass of material in the pan, and that the parts of the material are subjected in succession to the action of the galvanic current.

I also claim the employment of a solution of the nitrate of mercury in connection with a galvanic battery and a friction amalgamator containing mercury, substantially as set forth.

25,243.—Henry Brevoort, of San Francisco, Cal., for an Improvement in Quartz-crushing Machines:

I claim the relative arrangement and combination of the curved grinding shoes, E' E', having their front edges beveled and inclined backwards from their outer corners, and caused to revolve, as described, so as to gather in and return the coarser fragments towards the center of the series, substantially as set forth.

I also claim the arrangement and combination of a series of grinding shoes, E', with their front edges curved or inclined backwards, as described, with a corresponding inner series of reducing shoes, E, so that the coarser fragments are re-delivered in an inward direction to the reducing shoes, while the grinding and outward movement of the fine particles proceed continuously, substantially as set forth.

25,244.—Wm. Briggs, of Norristown, Pa., for an Improved Gun Lock:

I claim constructing the stock, A, and breech of barrel, D, so as to be susceptible of, and united to each other by the tang or breech-pin, C, and tapering screw-pin, E, and the spring hammer-guard, H, and trigger, P, arranged and combined with stock, A, essentially in the manner and for the purposes fully set forth.

25,245.—B. S. Church, of Manhattanville, N. Y., for an Improved Water Meter:

I claim, first, The arrangement of a drum, A, with the chamber, R, and buckets, C, as described, in combination with the trough, G, and the air-chamber, D, and operating substantially as and for the purpose set forth.

Second, The arrangement and combination of the trough, G, the pipe, H, the chamber, I, the air-chamber, D, and the drum, A, to operate substantially as and for the purpose specified.

25,246.—H. S. Clark, of Wyalusing, Pa., for an Improvement in Carriage Springs:

I claim the arrangement and combination of the U-shaped leaves, B B, with the elliptical springs, A A, as shown and described, so that the extremities of the leaves, B B, will approach each other, and will be secured to the centers of the springs, A A, as specified.

[This invention relates to an improvement in that class of springs known as elliptical springs, and it consists in connecting two such springs at their ends by two additional leaves bent into the shape of a W, and attached to the bed-leaf of each of the springs by means of bolts or rivets which pass through the main-springs and through the inner ends of the additional leaves near to the place where the latter join. A plate is placed over the joint, so as to strengthen the central part of the spring, and the trouble to connect two elliptical springs by means of ears at their ends is avoided.]

25,247.—F. J. Crissey, of Leesburg, Va., for an Improvement in Washing Machines:

I claim the arrangement of frame, E, supports, i i, upright shaft, D, rollers, B, supports, c c c, and collar, G, in combination with the bottom of the tub, when the parts shall be constructed and arranged in relation to each other as substantially set forth.

25,248.—Addison Crosby, of Fredonia, N. Y., for an Improved Valve for Steam-engines:

I claim the employment, as an induction or eduction valve in a steam-engine, of a rolling or oscillating valve, composed of two segments, having their faces, a a, eccentric to its axis of oscillation, and with an opening, d, between the segments, substantially as described.

[This valve is of the rolling play kind, and so constructed as to be perfectly balanced except when quite closed, whon the pressure of the steam just acts upon it with sufficient force to keep it tight. The faces of the valve and seat are made eccentric to the center of motion of the valve, so that they only touch when the valve is closed, and the valve works without friction. Two of these valves are required for the induction and two for the eduction.]

25,249.—Horace H. Day, of New York City, for an Improvement in Elastic Cloth:

I claim the new elastic cloth described, consisting of stockinet cloth, elastic gum and flock combined, substantially as set forth, so that the elastic gum is covered on one side by the stockinet, and on the other by the flock, the said elastic cloth being a new manufacture.

25,250.—Samuel De Vaughan, of Washington, D. C., for an Improved Scroll-Sawing Machine:

I claim the vertical plates, g, and guide-blocks, h, plates m and m' and guide arm, i, for the purpose of a compound guide, as set forth.

I claim the manner of operating link, k, on bearing, u, in combination with block, h, and guide arm, i, for the purpose set forth.

25,251.—J. A. Falk, Andrew Johnson, and G. A. Erickson, of Altona, Ill., for an Improvement in Harvesters:

We claim the arrangement of the wheel, H, which is provided with the pin, a, near its periphery, with the bar, i, and pulley, s, the same being constructed in the manner set forth, for the purpose of operating the bands which drives the endless belt, K, substantially as described.

25,252.—T. F. Frank, of Ischua, N. Y., for an Improvement in Opthalmic Vapor Apparatus:

I claim the opthalmothological vapor bath, constructed and operating as before described, for producing medicated vapor,

25,253.—Albert Fuller, of Cincinnati, Ohio, for an Improvement in Faucets:

I claim encasing an elastic plug valve in the above-described metallic shield, for the purpose set forth.

25,254.—Quincy A. Gilmore, of New York City, for an Improved Machine for Cutting and Screening Bituminous Limestone or Asphalt:

I claim, first, The rotary cylinder or drum, a, carrying knives or cutters, b b, substantially of the form described, arranged in rows, either with or without the raised bands, substantially as shown, or in rows parallel or oblique to the axis of the cylinder, for cutting asphalt, sometimes known under the name of bituminous limestone, substantially as described.

Second, I also claim the application of the machine as a whole, substantially as described, to the purpose of cutting and screening asphalt or bituminous limestone.

25,255.—A. Golay, of Mobile, Ala., for an Improvement in Cord Guides for Sewing Machines:

I claim the arrangement and combination with the adjustable plate, D, of the groove, f, and guides, c d e, substantially as shown and described, so that the cord may be guided and conducted between two or more thicknesses of cloth, as set forth.

25,256.—Elias Graham and I. N. Patton, of Elizabethtown, Ky., for an Improvement in Flour Bolts:

We claim the combination of the wedged sliding ribs, C, with the rods and screws for adjusting the same, in the manner and for the purposes set forth.

[The object of this invention is to enable the miller to tighten the bolting cloth upon the reel to any degree of tension. It consists in an arrangement whereby the radial arms of the reel, or rather the ribs over which the cloth is stretched can be extended, thereby increasing the diameter of the bolting reel and stretching the bolting cloth tight thereon, and keeping it thus stretched.]

25,257.—J. H. Green, of Christiansburg, Iowa, for an Improved Billiard-cue Tip:

I claim a tip or point for billiard or bagatelle cues, made of any compound described, so as to dispense with the external application of chalk or other substance to the point of the cue.

25,258.—Benj. L. Griffith, of Reading, Pa., for an Improved Hollow Grate-bar for Steam-boilers:

I claim two or more tubes, C, attached to hollow boxes, D, connected to the fire-box, by means of hollow perforated screw plugs, G, and arranged in sets to complete the grate, as and for the purpose set forth.

25,259.—Henry Gross, of Tiffin, Ohio, for an Improvement in Breech-loading Fire-arms:

I claim, first, Giving the chamber its longitudinal motion upon a bed-piece which remains fixed during such motion, and in revoluing carries with it the chamber, substantially as specified.

Second, The roller, r, or its equivalent, upon the cheek-piece, and its combination with the groove, g, d, substantially as and for the purpose set forth.

Third, The double eccentric-head of the lever, L, when connected with the chamber and bed-piece, substantially as described.

Fourth, The adjustable bearing piece for the eccentric, g, of lever, L.

25,260.—Albert W. Hale, of New York, N. Y., for an Improved Fastening for Hoop Skirts:

I claim the method of connecting and fastening the ends of the hoops, B, by means of the cap, A, one part of such cap, with the end of the hoop, forming a point or extension, b, to enter a recess, a, in the cap on the other end of the hoop; and such cap also furnishing the recess to receive the said points or extension of the other end of the hoop, when the cap and hook are bent in the manner and for the purpose described.

25,261.—William W. Hammond, of New York, N. Y., for an Improved Escapement for Chronometers:

I claim the employment of the hollow semi-cylinders on the vibrating lever, substantially as described, in combination with the escapement wheel, and the balance and verge, as set forth.

I also claim, in combination with the escapement, substantially such as described, or any equivalent therefor, the employment of the holding spring, substantially as and for the purpose specified.

25,262.—James Harrison, Jr., of New York, N. Y., for an Improvement in Sewing Machines:

I claim, first, The combination of the frame or feeding lever, j, bar, m, spring, o, and regulating screw, p, all constructed and operated as described, with the needle and needle-frame, i, for carrying the mechanism for rotating the needle, as described.

Second, I claim the adjustable bar or band, z, affixed to the lever or frame, J, in combination with the frame, j, for controlling the upward movement of the feed lever, as described.

Third, I claim the bar or band, z', in combination with the bar, m, screw, p, spring, o, and lever, J, as and for the purposes set forth.

25,263.—Royal Hatch, of Strafford, Vt., for an Improved Bed-bottom:

I claim the arrangement of a central supporting bar, F, with a sacking, E, both provided with double loops, d, and attached respectively to the bedstead, as and for the purpose set forth.

[This invention relates to an improvement on a spring bottom for bedsteads, for which Letters Patent were granted to Mr. Hatch, bearing date December 30, 1857. The object of the present invention is to render the bottom more durable than the patented one alluded to, and also to render the sacking capable of being taken up or tightened, if necessary, to compensate for the stretching of the same.]

25,264.—Alexander Hay, of Philadelphia, Pa., for an Improvement in Springs for Railroad Cars, &c.:

I claim as a new article of manufacture the construction of vulcanized india-rubber springs, in which the threads, or warp, or fabric, out of which they are formed, is made non-elastic before it is woven or knit, substantially as described.

Second, In combination with india-rubber springs, to be acted on by tension or stretching, I claim the tubes, A A, with their flanges, substantially as described, for the purpose set forth.

Third, In combination with the springs acting as described, I claim the supporter, P, with the opening, F, in each end, and holes, B B B, for tightening the spring, when constructed and operated substantially as set forth.

25,265.—Milo A. Holcomb, of Granby, Conn., for an Improved Metallic Razor-strop:

I claim a razor-strop made of polished steel, of the requisite degree of hardness, when possessing a sufficient degree of flexibility to enable the angle to which its surface forms with the edge of the razor to be lessened to the desired extent, in the manner and for the purpose as herein specified.

25,266.—Daniel Hussey, of Nashua, N. H., for an Improvement in Machinery for Winding Warps upon the Beam:

I claim the peculiar combination for maintaining uniformity of wind, or surface speed of wind on the yarn beam, the same consisting of the friction wheels, G, F, the lifter rack, K, the pinion, l, and the compound motion mechanism, or their mechanical equivalents; the whole being applied to the yarn guide rollers, and the mechanism for adjusting the yarn beam, substantially in manner and so as to operate as specified.

22,267.—Joseph and Isaac Kalbach, of Bernville, Pa., for an Improvement in Furnaces for Smelting Zinc Ores:

We claim constructing the crucible with a detachable bottom, and attaching it to the arch of the cylinder or collar and to the bed-plate, by the rings or annular plates, whereby we are enabled to empty the crucible at its bottom, and to remove the entire crucible through the bottom or the arch of the heat chamber, as may be required, the whole being arranged and susceptible of being used as herein set forth.

24,268.—Ebenezer B. Knight, of Malden, N. Y., for an Improvement in Machines for Holding Stones:

I claim providing the stone-holding machine with the suspending arms, c c, plates, j, and n, rod, i, and adjusting bolts, k k, or their equivalents, whereby said machine may readily be adjusted vertically and also horizontally, in the arc of a circle, substantially as described and for the purposes specified.

25,269.—Charles Livingston, of Redwood City, Cal., for an Improved Wind-mill:

I claim the cowl, D, with tubes, j, g, and wheel, B, combined and arranged for joint operation, substantially as and for the purpose set forth.

[This invention consists in the employment or use of a rotating cowl, wind tube and wheel, whereby wind can be conducted from elevated points down into valleys, and made to actuate wheels placed near the machinery to be driven. The object of the invention is to obviate the difficulty attending the elevated wheels in places where the wind is very variable, the elevated wheels being attended with considerable expense and liable to be disabled by sudden gusts.]

25,270.—Isaac Mallory, of Etna, N. Y., for an Improved Chute for Horizontal Water-wheels:

I claim constructing and arranging the scroll within the penstock, so that it can be turned, so as to partially close the orifice for the admission of water upon the buckets, and to thereby regulate the flow of water for any head, or for any quantity of water, essentially as above specified.

[This invention consist of an adjustable chute or scroll, so constructed and arranged within the penstock that by adapting the position of the scroll to the inlet of water from the flume, the volume of water may be regulated for any head or for any quantity of water, by the contraction or expansion of said inlet, the spiral form of the chute offering, by this arrangement, more or less surface opposite said inlet.]

25,271.—E. E. Marcy, of New York, N. Y., for an Improvement in Curing and Treating Caoutchouc:

I claim the improved process of curing india-rubber by combining india-rubber with the sulphuret of lead and carbonate of lead, or the protoxide of lead, in the manner hereinbefore described, and without the use of free sulphur in combination with the rubber, or with said compound, and the exposure of these compounds to steam or water, at the temperature hereinbefore stated, and in the mode pointed out.

25,272.—E. E. Marcy, of New York, N. Y., for an Improvement in Curing and Treating Caoutchouc:

I claim the improved process of curing india-rubber by combining it with the sulphuret of zinc and the hyposulphite of zinc, in the manner hereinbefore described, and subjecting the compound to steam and water, at the temperature stated, without the use of free sulphur, in combination with said conpound, substantially as set forth.

25,273.—E. E. Marcy, of New York, N. Y., for an Improvement in Curing and Treating Caoutchouc:

I claim the improved process of curing india-rubber, and producing an improved article of india-rubber, by combining india-rubber with the hyposulphite of zinc, in the manner hereinbefore described, and without the use of free sulphur in combination with the rubber, or with said compound, and the exposure of this compound to steam or water, at the temperature hereinbefore stated, and in the mode pointed out.

24,274.—R. D. Nesmith, of Franklin, N. H., for an Improvement in Machines for Picking Mill-stones:

I claim the spring, Q, upon rod P, provided with head, I, for limiting the extent of its action upon the picks, as arranged with the inclined plane, T, and cam, F, and the operating parts with which they are connected, in the manner and for the purpose specified.

25,275.—Samuel Nowlan, of New York, N. Y., for an Improvement in Apparatus for Manufacturing Illuminating Gas:

I claim the gas exhaust and expelling wheel, interposed between the retort and the condenser, constructed and arranged so as to operate substantially in the manner and for the purposes set forth.

25,276.—John H. Pein, of Hoboken, N. J., for an Improvement in Apparatus to Photograph on Uneven Surfaces:

I claim photographing on vases, or other uneven solids, by means of an apparatus substantially as herein described, and in the manner substantially as set forth.

25,277.—Edmund Queru, of New York City, N. Y., for an Improvement in Gelatinizing Oils:

I claim the jellification of castor oil by means of the process herein before described.

25,278.—Charles H. Raymond, of Southington, Conn., for an Improvement in Tinman's Machines:

I claim the movable and adjustable stand, M, and its revolving box, L, when combined with shaft, I, cap-plate, E, and screw, J, in the manner described and for the purposes fully set forth.

25,279.—Charles B. Sawyer, of Fitchburg, Mass., for an Improved Furnace and Ventilator:

I claim providing the fire pot with a series of small holes or openings, substantially as and for the purposes set forth.

25,280.—Edward L. Seymour, of New York, N. Y., for an Improved Ore Concentrator:

I claim, first, The rotating sieve in combination with the bellows, or their equivalents, operated by the act of rotation of the former, substantially as described.

Second, The application of two or more rotary sieves, combined with such an arrangement of "waste tubes," e, that the refuse of the upper sieve shall be led to constitute the supply or feed of the sieve next below it, as described,

Third, I claim rendering the receiving mouths of the "waste tubes," e, e', e'', adjustable, as described, and for the reasons given.

Fourth, I claim the use of the closed chambers or "traps," y, y', y'', below the sieves, as described and for the purposes explained.

25,281.—Philo B. Sheldon, of Prattsburgh, N. Y., for an Improved Composition for destroying Insects injurious to Fruit Trees:

I claim combining and employing the ingredients herein described in substantially the mode and proportions set forth, for the purpose of destroying borers, and other insects on fruit trees.

25,282.—J. H. Shipman, of Yorkville, N. Y., for an Improved Letter File:

I claim the arrangement of the movable hinged guards, B, in combination with the metal back, A and points, b, substantially as and for the purpose described.

[This invention consists in arranging opposite to the points which serve to retain the letters, sliding hinged guards that are turned over the points when the letters are on. These guards prevent the letters from coming off when the file is handled, and they are so arranged that they can be brought to fit the points if the latter are sprung to one side or to the other by the letters on them.]

25,283.—William H. Smith, of Newport, R. I., for an Improved Hose Coupling:

I claim the new article of manufacture, or hose coupling described, made by combining the open spiral flange, a, with a screw, D, as set forth.

25,284.—James Spear, of Philadelphia, Pa., for an Improvement in Stove Urns:

I claim the arrangement of the register in the base of the urn, with the ornamental receptacle for the cup, constructed in the manner and for the purpose described.

25,285.—A. L. Sperry, of Auburn, Ind., for an Improvement in Churns:

I claim the arrangement of the hook, i, and button, k, to operate in combination with the dasher, D, and breaker frame, E, in the manner and for the purposh herein specified.

[This invention relates to an improvement in churns that have a cylindrical tub with a vertical revolving dasher arranged on a cylindrical shaft which also carries a breaker frame with a series of breakers arranged outside the dasher, and it consists in a particular arrangement of a hook that serves to connect and disconnect the breaker frame with the shaft, and in the arrangement of a spring hook and button, whereby the breaker frame can be arrested, so that the dasher can be operated independently of the breakers. Both the hook and the spring hook are operated from the top of the churn.]

25,286.—Henry D. Stover, and J. W. Bicknell, of Boston, Mass., for an Improved Rotary Planing Cutter:

We claim the adjustable revolving guard, J, as constructed and connected adjustably to the cutter-head, carried by and having all its movements to effectually protect the operator from mutilation, and to hold down the material receiving shape, essentially in the manner fully set forth.

25,287.—Peter Sweeney, of Buffalo, N. Y., for an Improvement in Stone Saws:

I claim the employment of two plates, A A, in combination with the dish-formed cutter, C, arranged substantially as and for the purpose herein shown and described.

[This invention consists in securing in a peculiar way rotary cutters between two plates or betwee circular disks in such a way that the cutters are firmly retained in proper position, and a very efficient and durable device obtained for the intended purposes]

25,288.—Joseph Sweetser, of Biddeford, Maine, for an Improvement in Shingles:

I claim this fluting of the shingles.

25,289.—George Taylor and George H. Burger, of Worthington, Ohio, for an Improved Auger for Cutting Round Tenons:

We claim the arrangement and combination of the spring, E, with the shank, D, and tube, A, substantially as herein shown and described, whereby the plug, C, is rendered self-acting, as set forth.

[The object of this invention is to enable every workman to cut uot tenons perfectly round and at right angles with the planes on which they stand, so that when twc pieces of wood are fitted together the joint is perfectly close and square. A simple, cheap and efficient tool for this purpose is of great value. Its construction is fully explained by the claim.]

25,290.—Joseph B. Thompson, of Warrenton, Ga., for an Improved Feed Water Apparatus for Steam-boilers:

I claim the exterior water chamber, G, communicating with the supply tank, B, by pipe, a, and with the boiler, A, by force pump, P, and pipe, b, and provided with a valve, J, as set forth, in combination with the peculiarly constructed float, C, rods, E, and lever, F, operating as and for the purpose specified.

25,291.—William H. Thoss, of San Francisco, Cal., for an Improvement in Fire-plating Iron:

I claim preparing the iron after it has been cleansed with dilute acid, by immersion in a solution of borax, and after being dried, passing it through the molten copper, maintained at the required heat in a furnace constructed substantially as herein described, with a roof to concentrate the heat over the basin of molten copper, and with an aperture at one side to insert the iron to be plated, and a corresponding one on the opposite side, to receive the iron as it is drawn from the copper plate substantially as described, and for the purpose specified.

25,292.—William A. Vertrees, of Winchester, Mo., for an Improvement in Hemp Brakes:

I claim constructing the rocking-breaker frame of hemp or flax breakers in the manner described, and operating it by means of a slotted pitman, in such manner as that while the vibratory motion is communicated from the prime motor to the breakers, by machinery, yet they fall on the hemp or flax with a free stroke or flail motion, substantially as hereinbefore described.

25,293.—Nathaniel Waterbury, of Fond du Lac, Wis., for an Improved Shingle Machine:

I claim, first, The reciprocating bolt carriage, D, tilting-beds, J, J, circular-saw, I, and sliding-jaws, G, G, arranged relatively with each other as shown and operated respectively by the cam, C, cam ratchets, K, K, and pendants, o, o, belt, t, and levers and weights, J,' J,'' substantially as and for the purpose set forth.

Second, In connection with the reciprocating belt carriage, D, saw, I, and tilting-beds, J, J, the bars, L, L, provided with inclined slots, p, q, and connected with the frames, d', d'', of the jaws, G, G, by means of the pins, r, fitting in said slots for the purpose of elevating the bolts during their return movement, as described.

Third, The employment or use of the cam ratchets, K, K, attached to the framing, A, in connection ith the pendants, o, o, attached to the reciprocating bolt-frame, D, arranged substantially as shown for automically tilting the beds, J.

25,294.—Peter L. Weimer, of Lebanon, Pa., for an Improved Machine for Coiling Metal Pipe:

First, I claim the coiling cylinder, E, with the peculiar shaped groove, constructed and arranged as herein fully described and specified.

Second, I claim the arrangement of the two guide wheels, M, triangular piece, K, and shaft, L, when used in combination with the coiling cylinder, and for the purpose as herein fully described and specified.

Third, I also claim the moveable plate, F, and jack-screws, G, for the purpose of adjusting the guide-wheel shaft, L, to any angle required.

25,295.—Asa Wheeler, of Brattleboro, Vt., for an Improvement in Skates:

I claim the arrangement and combination of the adjustable heel-piece, F, heel-case, D, stock, E, screw, H, and front-straps, C, as and for the purpose herein shown, and described.

25,296.—John M. White, of New York City, for Improved Feed Water Heaters for Steam Boilers:

I claim the arrangement of the division chamber, C, supply and discharge pipes, F and G, and heating pipes, b b l, placed within the exhaust side pipe, B, as described, in combination with the relief pipe, H, by which, when necessary, the water may be passed directly to the boiler without being passed through the heating pipes, b b l.

25,297.—Abner Whiteley, of Springfield, Ohio, for Improvement in Harvesters:

I claim, first, So arranging the mechanism of the automatically operating door or shutter for preventing scattering and admitting the gavels to be discharged at regular intervals, as to permit the attendant to increase the intervals of time for the discharge of the gavels where the grain is thin upon the ground, substantially as described.

Second, The combination of the rake, q, with the door or shutter, R, for discharging the gavel at the time the door or shutter is opened for the purpose, whether it is at regular intervals or less frequently, substantially as described.

25,298.—Jeptha Avery Wilkinson, of Brooklyn, N. Y., for Improved Shears for Separating Paper:

I claim, first, Separating paper or other material by the joint operation of a revolving shear and a stationary surface, when said stationary surface is so formed and placed as gradually to approach the path described by the shear in its revolution, and compress the said paper or other material on to the edge of said revolving shear, in the manner and substantially as specified.

Second, I claim the elastic roller or rollers, e e, in combination with the stationary surface, E, and revolving shear, c, on the cylinder, D, whereby the paper is passed through and separated progressively as at two operations, as set forth.

Third, I claim the arrangement of the shaft carrying the rollers, e e, the springs, 12, and cams, 10, for elevating the rollers and preventing traction on the paper, as set forth.

25,299.—Frank C. Brown (assignor to William Brown), of Philadelphia, Pa., for an Improvement in Turn-outs for Railways:

I claim the addition of grooves on the circumference of car wheels, as now constructed, with a single flange and tread, and the placing of curved bars at turn-outs on the track of the road, to enter and operate on such grooves for the purpose of changing the direction of cars, substantially as and for the purpose set forth.

25,300.—Seth Boyden (assignor to himself and H. H. Jacques), of Newark, N. J., for an Improvement in Machinery for Hardening Hat Bodies:

I claim, first, The employment of a cloth, M, or its equivalent, in combination with a cone, E, in the manner and for the purpose substantially as shown and described.

Second, The arrangement and combination of the frame, I, shaft, J, eccentrics, h', rods, i, tubes, j, arms, l, shaft, K, eccentrics, p, rods, q, bars, L, and cloth, M, substantially as shown and described, so that the cloth, M, will be operated with a compound movement, as set forth.

25,301.—William P. Goolman (assignor to himself, S. B. Morris and William Hollingsworth), of Dublin, Ind., for an Improvement in Rotary Harrows:

I claim, first, The described application of friction rollers between rotary concentric harrows to elevate opposite sides of the respective harrows, in the manner and for the purposes set forth.

Second, The reversible arm, F, arranged between concentric harrows, A and B, to change the direction of the rotation of the said harrows, as explained.

Third, The reversible bent spindle, C, adapted in the manner set forth, to correspond with the relative obliquity of two concentric harrows.

Fourth, The described arrangement of the friction rollers, e e', and adjustable washer, g, on the arm, F, operating in the manner set forth, to vary the relative obliquity of the harrows.

25,302.—Daniel G. Greene, of North Bridgewater, Mass., assignor to himself and William Nash, of South Weymouth, Mass., for an Improvement in Wrenches:

I claim the combination of the movable jaw, B, inclined shoulders, U, with the pawl, H, and inclined shoulders, V, and enlarged hole, J, and ratchet teeth, H, said parts being constructed and arranged to operate in relation to each other, in the manner and for the purposes set forth.

25,303.—Michael Irion, of Utica, N. Y., assignor to himself and Jacob Heidel, of Oneida county, N.Y., for an Improvement in Shears:

I claim the combination of the cutting plat s, C C', the circular punch, D, and the circular die, E, to receive the punch, and surrounded by a cutting edge, as described, in connection with a pair of movable jointed arms, the whole so combined and arranged to operate in the manner as before more fully set forth.

25,304.—George Marlow and Michael Ralphe (assignors to A. D. Brown, U. C. Valette, and George Marlow), of Cincinnati, Ohio, for an Improvement in Lamps:

We claim, first, The described arrangement of the separate cup-formed back reflector, J, upon the inside of the door, K, in the described combination, with an open-backed parabolic or conical reflector, I, constructed as set forth

Second, The described arrangement of glazed doors, M and M', hinged vertically to the front angles of the lantern, and adapted in the manner set forth, to be fixed either in front of the lantern or against one or other of its sides, for the purpose explained.

25,305.—Theodore Marschall (assignor to Lighte & Bradbury), of New York, N.Y., for an Improvement in Pianoforte Actions:

I claim the spring-supporting post, K M N O, when used in the described combination with a stud, I, separate and distinct from the moving parts, to detain the hammer at any determined height, while the jack descends sufficiently to re-engage beneath the hammer butt.

25,306.—E. L. Pratt (assignor to himself and R. B. Fitts), of Philadelphia, Pa., for an Improvement in Churns:

I claim, in combination with the rotary case or body, A, of a churn, a diaphragm, or piston, C, adapted both to move upon and be moved by a screw shaft, D, or its equivalent, placed horizontally in the said case, as described; the said diaphragm, C, and shaft, D, being constructed and combined together as set forth.

Second, I also claim the series of perforations, o o, through the diaphragm or piston, C, in combination with the movable perforated adjusting disk or plate, n, or their equivalent, the same operating together in the case, A, substantially as and for the purpose set forth and described.

25,307.—William F. Pratt (assignor to the E. Carver Company), of East Bridgewater, Mass., for an Improvement in Cotton Gins.

I claim the use of a naked or unshielded auger or cleaver, operating in the end of a ginning-roll of a cotton gin at or near the center thereof, substantially in the manner and for the purpose described.

25,308.—Allen Sherwood, of Auburn, N. Y. (assignor to E. P. Lenter, A. H. Goss, Wm. Hills and Ameretta Sherwood, of same place), for an Improvement in Grain-binding Mechanism:

I claim, first, The combination of the shield, F, and lever, L, both removable and located at one side of the delivery portion of the platform, so that the shield shall protect the lever from the cut material, and from one side of an open-ended grain-receiver (the fence, E, forming the other side thereof), where the grain is deposited previous to being bound us as described.

I also claim, in combination with the raker's stand, B, and binder's seat, C, the shield, F, and lever, L, so arranged that the raker, from his stand, may sweep the cut grain into the receiver, and the binder, from his seat, reaches beyond the receiver to catch the lever, L, as set forth.

I also claim, in combination with the grain-receiver, the inclined ledges, G H, under which the wire is passed, so as not to catch or interfere with the entrance of the grain therein, as set forth.

I also claim the slot and flanges in the shield, I, said flanges serving as a guide for properly bringing down the foot of the lever to insert the wire in the twisting wheel as set forth.

I also claim, in combination with the lever, L, the clamp, s, located in close proximity, to the handle, v, so that the binder, as he draws up the gavel, may check the paying-out of the wire, and thus bring it tightly around the bundle as set forth.

I also claim the combination of a removable shield and lever, F L, on the platform, with a removable twisting meachanism on the fence or side of the platform, G, for the purpose of adapting an ordinary hand-delivery mowing machine into a self-binder, or vice versa, without in any manner altering the parts which enables in to be so exchanged, except to attach or detach them, as set forth.

25,309.—Daniel Dodge, of Keeseville, N. Y., for an Improvement in Nail Machines:

I claim the combination of an anvil, B, and fixed die, C, or other equivalent fixed surfaces, a roller, E, hammers, F G, and a vibrating guide, I, the whole operating substantially as described.

And I also claim the operation of a hammer, in combination with the roller, E, and anvil, B, by means of an eccentric on the roller shaft, and a universal joint at the connection of the hammer with the connecting-rod of the eccentric substantially as described.

RE-ISSUES.

Michael A. Dietz, of Brooklyn, N. Y., for an Improvement in Lamps. Patented May 3, 1859; reissued August 30, 1859:

I claim combining the deflector with the chimney band, by mechanical devices, so as to retain the former in its proper relative position without the use of solder.

Henry Ehrenfeld, of New York City, for an Improved Device for Converting Reciprocating into Intermittent Rotary Motion. Patented June 21, 1859; reissued August 30, 1859:

I claim, first, Arranging the lever, C, and dog, B, in combination with the grooved wheel, A, or its equivalent, in such a manner that said lever and dog act on the wheel, without a connection to the center or hub of the wheel, substantially as and for the purpose specified,

Second, In combination with the lever, C, dog, B, and wheel, A, I claim the arrangement of the groove, d, or its equivalent, in the hub of the wheel substantially as and for the purpose specified.

Third, I claim arranging the lever, C, with the dog, B, permanently attached to it in such a manner that the direction of the said lever, when it is in its place, makes an angle of 90°, or nearly so, with a line drawn from the center of the wheel through the dog substantially as specified.

Sidney S. Hogle, of Cleveland, Ohio, for an Improvement in Harrows. Patented March 7, 1857; reissued August 30, 1859:

I claim causing the points of the teeth of a rotating harrow to descend deeper into the ground on one side of their axis of rotation than they do upon the opposite of the same, for the purpose of enabling the dragging force which may be exerted upon said harrow to impart a positive rotary motion thereto without the aid of gearing wheels.

Archibald G. Shaver, of Hartford, Conn., for an Eraser and Pencil-sharpener. Patented March 8, 1859; re-issued August 30, 1859:

I claim, first, The curved blade eraser, as specified, forming on one side a convex surface, substantially as and for the purposes set forth.

I also claim, in combination therewith, the pencil-sharpener and pointer as described.

ADDITIONAL IMPROVEMENT.

Douglas B. Jordan, of Cumberland, R. I., for an Improvement in Mode of Oiling Journals. Patented March 15, 1859; additional improvement dated August 30, 1859.

I claim, first, The hinging the dish or bucket, G, to the rod, J, as shown, for the purpose set forth.

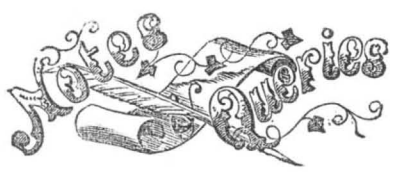
Second, The dish or bucket, G, in combination with the several parts marked C D E F and I, for the purpose set forth and described.

DESIGNS.

Jean Baptiste Virolet, of New York City (assignor to John W. Hoyt, of same place), for a Design for Floor Oil-cloths.

Henry G. Thompson, of New York City (assignor to The Hartford Carpet Manufacturing Company), for a Design for a Carpet Pattern (three cases).

Henry G. Thompson, of New York City (assignor to The Hartford Carpet Manufacturing Company), for a Design for a Three-ply Carpet Pattern.



E. S., of La.—We make no charge for the drawing of Thompson's bagasse furnace sent you. Your remarks on steam boiler explosions contain no new ideas. We thank you for the complimentary manner in which you acknowledge the service we have rendered you, as well as for the gold dollar which you presume to be due us for postage. You are more thoughtful than most of our correspondents, and we trust others will in future take a pattern by your example. We pay every day from $3 to $5 for postage, much of which sum is paid upon letters of no profit to us, but to answer inquiries of interest only to those soliciting the information. We are willing to find paper and envelopes and to use our time in answering inquiries when stamps are enclosed for postage, but we do not like very well to prepay postage out of our own "till" to answer letters of interest only to the writers. Correspondents will please to heed our hint. A single stampis a small item, but in the aggregate of our correspondence, they cost us several hundred dollars every year.

C. H., of S. C.—A machine for making ice was invented and patented by the late Dr. Gorrie, of Apalachicola, Fla. He did not meet with success in his efforts, and, so far as we know, there is not an ice-making machine in operation in this or any other country. If ice could be produced by machinery at $5 per tun, there is no doubt it would be a source of immense profit to the inventor. If some of our savans of science would come down a little from their airy flights, and give this subject some of their attention, it would be honorable to them, and might result in a benefit to the human race. Members of the A. S. S., think of this!

J. G. T., of Ohio.—Carey's rotary pump has a spring behind the packing of the piston to compensate for the unequal wear. Your idea on this point, therefore, is now in practical operation.

J. F. H., of ——.Chiropedists deaden the pain of corns in various ways before they operate. Ice, pressure, the application of laudanum and chloroform all tend to deaden the pain. We do not credit the ridiculous story going the rounds of the press about a dead body being found in a lake at Vermont, by some quicksilver being put into a loaf of bread and thrown into the water.

J. B., of Pa.—The carved work on wood is mostly executed by hand. Some ornamental moldings on looking-glasses are done with cement.

J. D. T., of Ky.—We do not advise the use of galvanized iron pipe for conducting water into houses, because the zinc is liable to decomposition. Persons do not generally perspire so much when asleep as when awake in warm weather—all other conditions being equal.

J. C. J., of Ala.—A good alloy for the journal-box of your wheel may be made by melting together copper 90 parts; tin, 10; lead, 8. Melt the copper first, then add the tin and lead, one after another until all are fused, when the alloy should be first run into ingots, then cast afterwards in a proper mold.

E. P. C., of ——.To make your copal varnish dry much faster, add an ounce of the oxyd of manganese to it while hot, and stir well. From your description of the cutter and hollow mandrel for turning irregular forms, we judge that your invention is embraced in Alcott's lathe.

S. T., of Mass.—There is no such principle of action in mechanics as "suction," although most persons have a different opinion. That which is commonly called "suction" is "pressure."

J. B., of Mo.—To remove blood stains from cotton and linen, soak them first in cold water, then wash with soap. If you use hot water first, it will make the stains difficult to erase, as the heat will render the albumen of the blood insoluble.

H. M. S., of N. Y.—A bell is heard at a much greater distance when placed in a steeple than when situated near the ground. See an article on bells in our last volume, which explains this fact.

P. J. B., of N. Y.—The Alizarin ink is described on page 128 of our present volume. Wood vinegar is made by distilling wood in retorts, then purifying the liquid that is condensed. It is very strong unfermented vinegar, principally used in the arts of calico printing and dyeing, and for making the acetate of lead. Nordhausen vitriol is dry concentrated sulphuric acid made in Paris.

S. O. C., of N. Y.—We, like yourself, greatly desire to witness aerial navigation rendered safe and practical, but no plan yet proposed to us is reliable.

R. B. R., of Cal.—The substance which you have sent is very pure carbonate of lime (chalk), and is equal to the finest specimens of "French whiting."

W. F., of Ind.—If, as you state, electricity and cohesion are the same thing, how is it that electricity produces repulsion, which is the very opposite of cohesion?

Hiero, of Ohio.—We have made a careful examination of your rejected case at the Patent Office, and have delivered the report over to your correspondent here, from whom you will receive it. We found on examination that your papers were badly prepared, evidently by some one wholly unskilled in the business.

J. B. S., of N. Y.—Gypsum is calcined to deprive it of its water of crystallization, in order to convert it into plaster-of-Paris.

S. S. F., of Ohio.—Railroad car wheels have been constructed having two flanges. The idea is an old one.

W. Y., of Pa.—There is no substance known to us which is an effectual extinguisher of the cockroach. The trap illustrated on page 68, Vol. XIV., of the SCIENTIFIC AMERICAN, is a good cockroach catcher, we believe. You had better try it. The advertised remedies are not of much account.

A. W., of Ohio.—We are aware that the practice of the Patent Office has somewhat changed in certain classes of cases, such as agricultural implements, &c., in regard to how much shall be allowed under one application and one fee. A more liberal policy prevails in this respect than formerly, which we are glad to acknowledge.

C. D. P., of Ohio.—Our pamphlet of information to inventors contains just the advice you seem to need, and we would have mailed you a copy had you given us your Post-office address. Any of your neighbors who may be desirous of obtaining patents can be furnished with our pamphlet of advice gratis, by sending their addresses to this office.

G. M., of N. Y.—We have received information from the Hon. Lewis Cass, Secretary of State, from which it appears that, as your father has declared his intention to become a citizen, you are entitled to apply for a patent by paying the fee of $30, which is the sum required of citizens. Being a minor, you are entitled to the rights and privileges secured to your parent.

F. B. S., of N. Y.—We think a patent can be obtained on your contrivance for holding paint-brushes in water, but whether it will pay you or not we cannot of course say. If you decide to publish it, we will get up an engraving and present it to the public through our columns. Please write us your decision.

S. F. D., of Maine.—You can find an account of Jonathan Hornblower's engine in Nicholson's Operative Mechanic, also Herbert's Encyclopedia. It was patented in 1771; and it does not appear that it gained public patronage or approbation, as it was in no way superior to Watt's expansion engine. If you procure a patent for an invention and another person patents an improvement upon it, he could not use your invention without paying you; neither could you use his.

THE BEST GRINDSTONE.—L. B. Johnson, of Cleveland Ohio, has remitted $2 to pay for one years' subscription to the SCIENTIFIC AMERICAN, to be awarded to the person who shall exhibit, at the approaching State Fair to be held in Albany, the best grindstone for farmers' use. Will Col. Johnson please take notice?

S. N. T., of Mass.—A self-acting chain, made to operate by a coiled spring, could not be patented. Coiled springs have been employed for operating this and some other class of small machines requiring moderate power.

G. G., of Tex.—The building represented in the vignette which forms the heading to this paper is a very good representation of the Patent Office at Washington. Some years ago we represented the plan view of the building as it then was; but many improvements and changes have been since made, so that you would get only a poor idea of the interior of the structure, as at present, by inspecting the views referred to.

F. G., of Miss.—Your mosquitoes must be of a very vicious species, if they attack animals and persons, as you state. At the North, we use nettings over our beds, in some localities, for a few weeks; but the mosquitoes can usually be banished temporarily by burning a small piece of camphor in the room. Some very humane persons place a piece of raw beef in close proximity to their beds, and we are informed it answers the desired purpose; the mosquito will feast upon the beef so long as it is fresh, without troubling themselves to attack the "human form divine" for better aliment.

I. E., of Texas.—You propose to employ a windmill on the prairie to pump water from a spring into an elevated reservoir, the latter to be used for the purpose of a regulator to operate a wheel, so that a constant power may be obtained. The same plan has been suggested to us many times, and it may answer well for many situations where the winds are variable, so that when there is not a sufficient aerial current to move the mill, the reservoir, having a stored-up supply of water, may be used to operate a wheel. All windmills should be furnished with adjustable regulators for setting the vanes to suit the pressure of the wind.

C. D. M., of Miss.—Out of the fourteen volumes of the SCIENTIFIC AMERICAN which we have published, previous to the commencement of our New Series, we can furnish only four. We have a few copies left of Vols. VI., VII., XIII. and XIV., which may be had at our office at $2.75 each, or by mail at $3.50.

E. L. G., of Conn.—The friction on any journal is in proportion to the weight upon it, and the nature of the bodies in contact. The amount of it upon a smooth cast-iron journal working in a brass box, and lubricated with tallow, was found to be about one-fortieth of the pressure or weight. A smooth iron journal running in a box of gun metal gives the most favorable results. This subject is somewhat intricate, because much depends upon the nature of the lubricating agent to modify the effects of pressure. Lard, soap, sperm oil, and tallow, are good lubricating substances.

A. W. G., of Va.—The husking thimble is a convenient article. It can be obtained from J. H. Gould & Co., of Alliance, O.

L. F. M., of S. C.—The best way to prevent rifles from becoming rusty is to wash them well after being used, then dry the barrel with a wad of cotton, and finally wipe out with a rag saturated with turpentine.

Money Received

At the Scientific American Office on account of Patent Office business, for the week ending Saturday, Sept. 3, 1859:—

G. & R., of La., $35; L. B., of Cal., $30; N. J. C., of La., $50; G. A. C., of Conn., $55; J. McC., Jr., of Mass., $25; E. W. D., of Mass., $15; E. F. J., of Ohio, $55; S. T. T., of Ill., $30; R. C. C. of Ga., $30; L. L., of N. Y., $55; J. P., of N. Y., $25; G. A. C., of Conn., $25; O. F. W., of N. Y., $55; N. & B., of Tenn., $30; E. H. H., of Ga., $30; F. & C., of Pa., $25; J. E., of Fla., $30; W. T. L., of Mich., $30; E. D., of La., $60; R. L. & C. S., of N. Y., $30; J. H. B., of Ind., $30; J. M. C., of N. Y., $25; R. L. U., of N. Y., $15; O. F. W., of N. Y., $25; G. W., of Pa., $30, H. S., of Conn., $30; J. A. B., of Pa., $25; J. K., of N. Y., $30; J. S., of Maine, $25; J. O. G., of Cal., $30; T. C. H., of Ga., $30; J. H. R., of Iowa, $30; A. S., of N. J., $25; J. E., of Fla., $25; C. T. P., of N. Y., $250; W. H. B., of N. Y., $25; D. W., of N. Y., $30; G. J. P., of Mass., $35; S. T. H., of Ill., $25; G. G. N., of Mass., $35.

We have also received $30 in gold by the American Express Company, from some person unknown to us. We wish persons sending money by express would put their names on the corner of the envelope covering the remittance, if they have not time to write a note of explanation to enclose with it. Express companies, also, would oblige their patrons, and often save themselves much trouble, by writing or stamping upon each parcel the name of the town from whence remittances or goods are sent.

Specifications, drawings and models belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Sept. 3, 1859:—

A. K. of Ill.; J. P. of N. Y.; T. S. of Cal.; J. H. R. of Mich.; J. S. D. of N. J.; J. K. of N. Y.; R. L. U. of N. Y.; A. K. of Ill.; J. A. B. of Pa.; A. S. of N. J.; B. & C. of N. Y.; G. & M. of Ill.; E. W. D. of Mass.; J. McC., Jr., of Mass.; H. H. of Mass. (two cases); E. D. of La. (two cases). J. S. of Maine; J. A. of N. J. (two cases); T. & J. of Pa.; R. S. L., of Conn.; F. & C. of Pa.; S. F. Van C., of Cal.; E. F. J. of Ohio; G. A. C. of Conn.; O. F. W. of N. Y.; J. E., of Fla.; G. G. N. of Mass.; W. H. B. of N. Y.; S. T. H., of Ill.

Literary Notices.

KNITTING WORK: A Web of Many Textures, Wrought by Ruth Partington. Brown, Taggard & Chase, Boston; Sheldon, Blakeman & Co., New York.

That Mrs. Partington is a great old lady we are fully prepared to allow, and we can add that we are always glad to see her looking over her spectacles or reproving Ike in the columns of our exchanges, but we think it rather too good a joke to pass unenjoyed, to make a book out of the old lady's bad English and peculiar morals. With all due respect to the author, B. P. Shillaber, the book bears marks of forcing wit to fill the required number of pages, and although the paragraphs are well and funny in themselves, yet, like the man who borrowed a dictionary to read through, we must remark, "Its a very nice book, no doubt, but the plot is not quite clear." If the author is ambitious to appear between "boards," let him try something better, for he is capable of it.

A POPULAR TREATISE ON GEMS. By Dr. L. Feuchtwanger. D. Appleton & Co., New York.

This work is well illustrated, well written, and full of valuable information. The pith of many technical and dry treatises will be found pleasantly served up in it, together with new facts and descriptions of American gems not found elsewhere. The introduction on crystallography is about as comprehensive and simple an elucidation of that science as we have seen. We think such a work was wanted, and will no doubt be appreciated now that it has come forth. The account of diamonds, their history and mode of cutting is peculiarly interesting to us poor folks who have them not, and in this work we can learn the history of the most celebrated ones, and look at their portraits, which is nearly as much as the possessors can do.

BLACKWOOD'S MAGAZINE, for July, contains a stirring article on Luther, Calvin, Latimer, and Knox, the four great reformers. Published by L. Scott & Co., Gold-street, New York.

History of the Scientific American and Important Information to Patentees.

We have printed a supplementary edition of the SCIENTIFIC AMERICAN, in which there is a history of its rise and progress, with illustrations of the building, externally and internally, showing the spacious rooms in which our immense patent business is conducted, and with life-like representations of the artists, engineers and specification writers at their daily labors. The same paper contains information on the many intricate points arising in patent law and practice, and comprises the best popular treatise on the subject ever published; it should be in the hands of all who are interested either in procuring, managing or using patented inventions. The legal information contained in this paper is the result of FOURTEEN YEARS' experience as patent solicitors, and it cannot be found in any other treatise on patent law. It also contains information in regard to Foreign Patents and Extensions. It is published in octavo form, sixteen pages, and mailed upon receipt of two three-cent stamps. Address MUNN & Co., publishers of the SCIENTIFIC AMERICAN, New York City.

Back numbers of the SCIENTIFIC AMERICAN, to the commencement of the New Series (July 2), are in all cases sent to new subscribers, unless the person ordering them directs to the contrary. Our object in so doing is that subscribers may have the volume complete, which nearly all desire.

PATENT CLAIMS.—Persons desiring the claim of any invention which has been patented within the last fifteen years, can obtain a copy by addressing a letter to this office, stating the name of the patentee, and date of patent when known, and enclosing $1 as fee for copying.

RECEIPTS.—When money is paid at the office for subscriptions, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a bona fide acknowledgement of our reception of their funds.

PATENT EXTENSIONS.—ALL PATENTS FOR Inventions, granted by the United States during the year 1845, will expire by their own limitations during the current year (1859) UNLESS EXTENDED ACCORDING TO LAW. The statute provides for the extension of Patents for an additional term of SEVEN YEARS, the grant being made to the inventor himself, or if deceased, to his heirs and administrators. The EXTENDED TERM inures solely to the benefit of the inventor or his heirs. Assignees or owners of rights under the first term of the Patent have no rights whatever in the extended term. The inventor or his heirs may, however, sell their interests in the Extension prior to the grant thereof, in which case the Extended Patent, when granted, becomes the exclusive property of such purchaser. Applications for Extensions must be made at the Patent Office at least 65 days prior to the extension of the Patent. The undersigned, having had great experience in Patent business, will promptly prepare the various documents and prosecute Extension cases on moderate terms. For further information address
MUNN & CO., Solicitors of Patents,
No. 37 Park-row (Scientific American Office), New York.

KNITTING MACHINES, CIRCULAR AND straight, and machine-knitting needles, of all sizes and gages, on hand and made to order. Address WALTER AIKEN, Franklin, N. H. 7 22t*

PARAGON COAL OIL BURNERS.—TO MANUfacturers of and Dealers in Coal Oils, and Coal Oil Lamps.—The above burners are admitted to be the best in use as to strength, least liability to get out of order, and ease of management; giving a larger blaze than any other burner. Lamps with the above burners, suitable for hand, hall, hanging bracket and side lamps; also, for Railroad Stations, Steamboats and Public Buildings. The best Burning and Lubricating Oils, as well as Lamps, in quantities to suit purchasers, at the lowest market prices. H. COULTER,
8 4t* No. 56 South Second-street, Philadelphia, Pa.

HARRIS BROTHERS' PATENT STONE, SMUT and Scouring Machines and Fans; warranted the best in use. These machines are extensively used in New York, Richmond, Rochester, and in other parts of the United States; also, in Mexico, England, Ireland, Canada and South America, and are comparatively as much super or to metal machines for smutting and scouring grain as a burr-stone is superior to a metal mill for grinding. Also, their Improved Rice-hulling Machines, which are unequaled. For particulars, address the subscribers, at Elizabeth, N. J.
10 2 HARRIS BROTHERS.

W. M. WHITTEMORE (SUCCESSOR TO John Whittemore & Co.) 91 Maiden-lane, New York, Commission Merchant and dealer in Cotton and Woolen Machinery and manufacturers' supplies. 11 13

PARTNER WANTED—WITH $5,000 OR UPwards, to take an interest in three good inventions, to manufacture and introduce them in this and other countries. Also, a process for making extra meal. The germ is separated from the corn before it is ground. For particulars, send a stamp.
11 6* O. P. STEVENS, Cleveland, Ohio.

SLIDE LATHES, IRON PLANING-MACHINES, Bolt-cutting Machines, Drills, &c.—A large stock on hand, at reduced prices. Address CHARLES H. SMITH, 135 North Third-street, Philadelphia. 11 6

15 HORSE HORIZONTAL STEAM-ENGINE, 10-inch bore, 24-inch stroke, with 7-foot fly-wheel, governor, pumps, &c., complete. A first-class engine at a bargain.
CHARLES H. SMITH,
11 3 135 North Third-street, Philadelphia.

A RECIPE FOR THE CURE OF HEAVES IN Horses will be sent to any one desiring it, for $1. A cure warranted in all cases, if given according to directions, which accompany the recipe. Address G. W. BACHMAN, Clifton Springs, N. Y.
11 1*

THE MOST VALUABLE BOOK OF THE AGE.—"The Graefenberg Manual of Health" has been revised and improved, and elegantly illustrated with beautifully colored engravings of the human system. Sent by mail to any part of the country on receipt of 25 cents. It is a complete guide to all diseases and their cures. It is written in plain style, and without scientific medical phrases, so that it can be comprehended by any one. The New York "Tribune" says:—"'The Graefenberg Manual of Health' is an able and comprehensive family book." Address orders to JOSHUA F. BRIDGE, M. D., Secretary and Consulting Physician Graefenberg Company, No. 32 Park-row, New York. Dr. B. is constantly in the office of the Graefenberg Company, where he will receive letters from or hold personal consultation with invalids. 11 4

FOR SALE—STATE RIGHTS FOR A MACHINE that is capable of husking 50 bushels ears of corn per hour. Lithographs of the machine, with full description, sent to parties wishing to purchase. The patentee would dispose of the entire right, as his time is fully occupied in other business. Address WM. H. SMITH, Post-office box 600, Newport, R. I. 9 3t*

NOW READY—QUACKENBOS' NATURAL PHIlosophy, for Schools and Academies. 12mo., 456 pages; $1. The attention of Teachers and School-officers is asked to this new School Philosophy, by G. P. Quackenbos, the popular author of the "Rhetoric," "First Lessons in Composition," and "Illustrated School History of the United States." It is illustrated in the most liberal manner, is equally adapted to use with or without apparatus, and is believed to possess superior claims to consideration in point of arrangement, accuracy, elegance of style, general interest, and adaptation to the wants of schools. Numerous errors current in the School Philosophies of the day are here corrected, and all recent discoveries in the various branches of the subject are embodied. Confident that this is such a work as is demanded by the progressive spirit of the age, and desirous of getting it before the educational world, the publishers will send a copy for examination, post-paid, to any Teacher or School-officer remitting one-half its price. Also, "History of France, from the Earliest Times to MDCCCXLVIII." By the Rev. JAMES WHITE, author of "The Eighteen Christian Centuries." 1 vol., 8vo. Price, $2.
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CROSSETT'S PATENT STAVE CUTTER—PATented July 1, 1844; re-issued March 2, 1858; renewed and extended June 26, 1858.—The above mentioned machine is warranted to cut more and better staves than any other machine in the United States, and is the most simple, cheap and durable. I hereby caution all persons against using and vending said machine (the main features of which consist in the stationary knife and vibratory bed-piece) without the legal right to do so. Offenders will be dealt with according to law. All persons wishing an interest in the extended term of said patent can obtain it by addressing the undersigned at Joliet, Ill.
5 10 GEO. I. CROSSETT, Assignee.

CHRONOMETERS, FINE WATCHES, NAUTICAL AND ASTRONOMICAL INSTRUMENTS, &c.—D. EGGERT & SON, No. 239 Pearl-street, New York, offer on favorable terms first-class Marine, Siderial and Pocket Chronometers; also, plain and finer quality of Watches, with new series train, so thoroughly adjusted as to be unaffected by any change of temperature, exercise or position in the pocket; Astronomical Clocks, Transit Instruments, Standard and Self-Registering Thermometers, Barometers, &c. 1 13eow*

PAGE'S LIME KILN (PATENTED 1854-57-58) Will burn 100 lbs. lime with 2½ cords of wood or 1¼ tons of coal in 24 hours. Coal not mixed with stone. It will burn all lime rock, marl or shell. Rights for sale by C. D. PAGE, Patentee, Rochester, N. Y. 2 10t*

Zur Beachtung für Erfinder.

Erfinder, welche nicht mit der englischen Sprache bekannt sind, können ihre Mittheilungen in der deutschen Sprache machen. Skizzen von Erfindungen mit kurzen, deutlich geschriebenen Beschreibungen beliebe man zu adressiren an

Munn & Co.,
37 Park Row, New-York.

Auf der Office wird deutsch gesprochen.

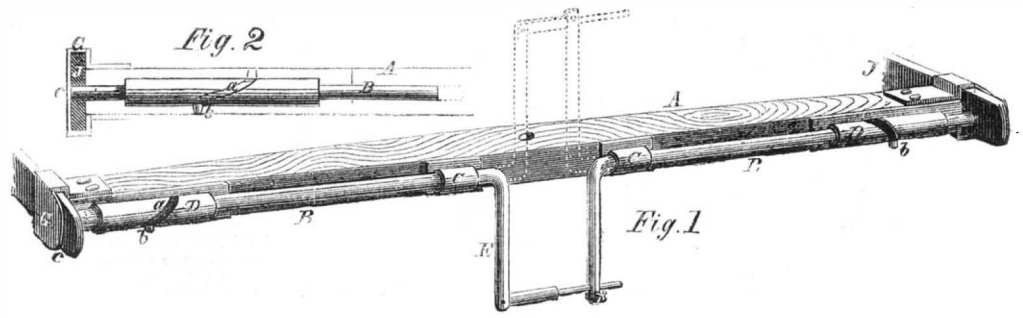
IMPROVEMENTS IN VEHICLES.

Often when a horse that is drawing a carriage becomes frightened or restive, it is a matter of some difficulty to release it from the whiffle-tree, or if it be in shafts, with the traces attached thereto; without there is some method of loosening the shafts, the lives of the persons in the vehicle will be endangered. The inventions of Eugene Duchamp, of St. Martinsville, La., provide for both these contingencies. The first is an improvement in whiffle-trees which is seen in the first engraving, Fig. 1 being a perspective view, and Fig. 2 an enlarged front view of one end of a whiffle-tree.

portion of the thill, G, has shoulders, *b*, that can pass in the box when the slot is upright and when the slot is horizontal catch against the inside and cannot pass out when the horse pulls the shaft. J is a swinging gate hinged to the metal bands, C, which has a recess made in it so that it prevents the box, E, rotating in its bearings when it is hanging over, and will allow it to be rotated when it is elevated out of the way.

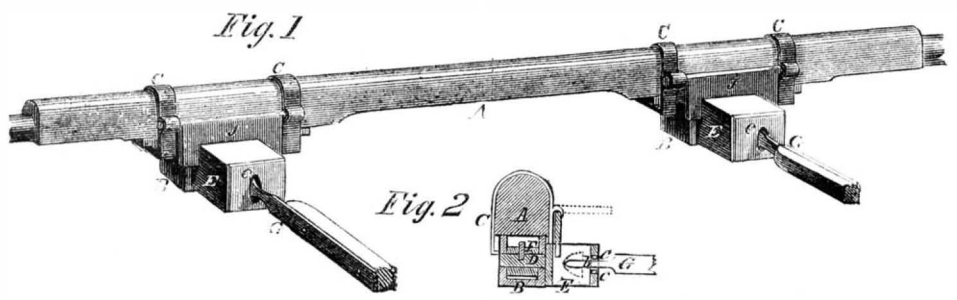
The inventor has two patents for these improvements, both dated August 16, 1859, and he will be happy to give any further information upon being addressed as above.

DUCHAMP'S IMPROVEMENTS IN VEHICLES.



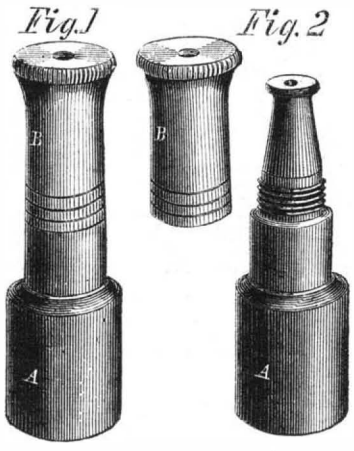
A a whiffle-tree detached from the axle-tree of a carriage. B B, are two rods which are fixed in the back of A, by guards, C, and D, and they are capable of longitudinal motion in opposite directions by means of arms or cranks, E E, which are bent portious of the rods, and are operated by the driver by means of a chain or rope. The guards, D, have slots, *a*, made in them obliquely to the axis of the rods, B B, by which the cranks E, become levers for operating the rods. The slots are in opposite directions, and there passes through them pins, *b*, that are attached to the bars, B B. Now it will easily be seen that by elevating the levers or cranks, E, the bars will be drawn inward, and by depressing them their ends will be forced outwards by the motion of the pins, *b*, in the curved slot, *a*. On each end of the whiffle-tree a loop or box, G, provided with a projecting lip, *c*, is placed and into these boxes the ends of the traces, J, are placed, the cock-eye of the trace being in a line with the rods B B. To secure the traces the levers, E E, are depressed, and the ends of the bars pass through the cock-eyes of the traces and hold them tight and secure, the boxes, G, preventing the traces from shaking off. When from any cause it becomes necessary to release the horse, the levers, E, are elevated, and the ends of the bars withdrawn from the trace-tugs and the horse is free to run away or do any mischief without endangering the lives of the occupants of the vehicle.

The second improvement is in the method of attaching shafts to vehicles by which they can readily be attached, and which will not be liable to accidental detachment, and no bolts or screws are used, and the shafts can readily be detached when it is desired. Fig. 1 is a perspective view of the front axle of a carriage, with the shafts attached, and Fig. 2 is a vertical cross section through the shaft and the connecting box. A is the front axle of a carriage, and B, is a hollow journal box rigidly secured to A, by metal bands, C. This box, B, serves as a bearing for the stem or gudgeon, D, of the coupling box, E, which is prevented coming out of the box, B, by a pin or collar, F, yet it is free to rotate in its bearing in the box. The coupling box, E, has an elliptical slot, *e*, through its end, and is made hollow, for the purpose of preventing the end of the thill-iron passing out of the box when the slot is turned a quarter round from the position shown in Fig. 1. The fluked



HICKS' PATENT GAS-BURNER.

Our engraving fully exhibits the construction of a valuable improvement in gas-burners, the invention of L. E. Hicks, of this city. Fig. 1 shows the burner, A, and cap, B, connected and ready for use, and Fig. 2 shows them detached. The burner is an ordinary one, the pattern called "fish-tails" being preferred. The invention consists in a metallic cap, B, which is provided with a hole in the top a little larger than the orifice of the burner. The cap is nowhere in contact with the burner except at the base, so that a little chamber is formed by the space between them, and the heating of the gas in this, and the opportunity it has to regulate its own pressure by being thus diffused before consumption, are the chief causes of the saving.



In presenting the above view of Hicks' patent gas-burner to the consideration of the public, we deem it proper to set forth some of its advantages over other burners now in use. The great necessity of a thorough means to regulate and economize the consumption of gas has prompted many inventors to make experiments in the improvement of burners; and the result has been the introduction of many that have combined to complicate rather than facilitate the object for which they have been intended. No such failure or intermediate degree of success has attended this burner. Its utility over others has been voluntarily acknowledged in numerous instances where it has been applied; while the perfect light which it emits has made it popular with those who have tested it. It contributes greatly to the saving of gas. Some of the parties using it testify to its saving one-half in the economy of its consumption.

It has been subjected to numerous tests by gas-engineers and scientific gentlemen, and certificates in favor of it have been shown us from such men as Professor John Torrey, United States Assayer; the late Dr. William H. Ellet, Chemist of the Manhattan Gas-light Company; J. K. Brick, Esq., Engineer of the Brooklyn Gas-light Company. Many eminent merchants and other well-known citizens in this city have adopted it, and laid aside the ordinary kind of gas-burners. Among the many persons who have Hicks' patent burner in use are the proprietors of the new Fifth-avenue Hotel.

The patent has been assigned the the New York Gas-burner Company (office 346 Broadway, room No. 18), who are manufacturing them on a large scale. Further information will be cheerfully given by addressing the company as above.

THE EXPENSES OF A PRINTING OFFICE.—Some idea of the expenses of a printing-office may be formed when we state (what is really a fact) that the white paper alone on which this week's edition of the SCIENTIFIC AMERICAN is printed, costs the large sum of $932·88. For the press-work, *i. e.*, the simple item of printing (without including editorial labor, composition, electrotyping, wrapper-writing, folding and mailing, and other minor expenses), on this week's edition we pay over $220. It is difficult for subscribers who receive their SCIENTIFIC AMERICAN regularly, fifty-two times in the course of a year (for which they pay only two dollars), to conceive the fact of the edition of a single week costing so much money; nevertheless, our figures as given above are literally true.

CALIFORNIA QUICKSILVER MINES.—Very rich quicksilver veins were discovered at Enriquita, Cal., in January last, by Mr. C. J. Laurencel and extensive preparations have recently been made to work them. Roads have been made and furnaces have been erected, and about the 15th of August they were to commence smelting the ore. The mines are situated twelve miles from San Jose, in the canon of the Sierra Azul, through which flows the Capitancillos creek. The Guadalupe mine is situated in the same canon, a mile and a half lower down, and the road to the Enriqueta mines runs directly through the Guadalupe hacienda.