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## Densmore's Improved Boiler

The engravings are views of a boiler which since its first introduction, five years ago, has given eminent satisfaction in its qualities for rapidly generating steam, keeping up a constant circulation of water, and economizing fuel. Over two hundred of them are now in use, in all parts of the country, for stationary and steamboat purposes. Its construction ap pears to be very favorable to perfect combustion, and the facts sustain this opinion.
The lower portion of the boiler is in the form of a truncated cone and the remainder cylindrical. The fire box is of unusually large proportions, conforming to the shape of the lower part of the shell. A represents the shell of the boiler and B the fire box. In this box, on the side farthest from and op posite to the door, C , is a tube cylinder, D. This cylinder is inclined, con forming to the slant of the boiler, small portion of itscircumfer, small portion of itscircumference form ing the outer shell, as seen in Figs. and 3. The lower front portion of thi cylinder extends below the grate, E and the heat of the fuel must impinge on theinclined front of the cylinder as it rises, thus securing a continuous circulation of the water. The arrows show the direction the gaseous products of combustion take. They rise to the space between the top of the cylinder and the crown sheets, then turn, passing down through the tubes -the interspaces between which are filled with water-to the bottom of the cylinder. From thence they rise in the cypace Fom they rise n the space of the and the shell of the the stack on the top. If the iron jacke is not used the smoke may escape through the space, G, directly to the chimneテ.

Fig. 2 is a transverse section across the boiler, taken on a line with the top of the front of the tube cylinder, and Fig. 3 is a similar section just over the grate. It will be seen that the area of the grate is of crescent shape, and that by the inclination of the tube cylinder and the sides of the fire box the space is gradually contracted to the top of the cylinder. This insures the top of the cylinder. This insures a very large grate surface and a correspondingly extended heating surface on the convex front nature it must become equal to the population of the globe, in | of the tube cylinder, the concave sides of the fire box, and its | 1900. |
| :--- | :--- | :--- |

top.
The steam room above the water line is ample so that only dry steam is delivered to the engine, and the boiler is not liable to foam. For burning bituminous coal this boiler is especially adapted. When built for this purpose the first row of stay bolts above the door at H are hollow, screwed through the outer and inner shell, and upset and riveted. These extend around from point to point marked I in Fig. 3. A strap having holes of corresponding diameter with those in the hollow stays and at the same distance apart, is secured to the outer surface of the boiler and held by lugs as guides, which permit it to slide by means of a lever to act as a damper, covering or uncovering the holes in the stay bolts as may be desired. When uncovered, atmospheric air rushes in in sufficient volume to add oxygen to insure the perfect combustion of the fuel. We have seen these boilers thus ar ranged and burning bituminous coal, and the smoke issuing from the stack was visible only as a steam-like vapor, having parted with its carbon, which in fine particles usually makes the unconsumed smoke from this kind of fuel so dense and black.

This boiler has more than double the amount of fire box surface to a foot of grate than ordinary boilers, and all of this surface is inclined toward the fire, so that the radiation of the heat is equal on every part of it. The inclined position of the tube cylinder and of the walls of the fire box, allows the steam, as it is formed against these surfaces, to leave them and flow upward against the outer shell, leaving the water solid against the fire plates preventing them from burning. The water is fed in around the bottom of the tubes and the strongest heat being at the upper portion of the tubes the cooler water is not lifted rapidly. This boiler is adapted to any kind of fuel which is used under other boilers. It is made of the best iron and thoroughly stayed in all its parts. It is built of different sizes from fifteen to three hundred horse power. No masonry is required in setting it, the boiler resting on legs.
Patented Sept. 15, 1863. For further particulars address

Densmore \& Black, patentees and manufacturers, 388 West 43d street, New York city.

The Offictal Catalogue of the products of the United States exhibited at the Paris Exposition is a pamphlet of 172 pages, just published in French, German and English. Fortythree pages are devoted to a statistical and geographical review, compiled, if we may judge from the closing paragraph by some enthusiastic and patriotic Yankee. The paragraph alluded to exhibits the celebrated truth that as our population
alluded to exhibits the celebrated truth that as our population
was thirty-five and a half millions in 1865 , so by the law of

It is a cylinder of sheet metal pierced with minute holes for the admission of air. It can be opened and placed around the trunk of a tree and secured by a rod passing through ears which project through holes in the outside lap of the cylinder. The cylinder is sunk a few inches in the earth and held by the soil being pressed around it and over the feet or legs secured to it At the top is attached a piece of oiled cloth or painted canvas the top of which is held closely around the painted canvas the top of which is held closely around the
trunk by a string. The longitudinal seam is then sewed up trunk by a string. The longitudinal seam is then sewed up
or secured by a cord run in, so that all is kept ticht below or secured by a cord run in, so that all is kept tight below
that point. A patent for this device was obtained Jan. 16, 1867, by George W. Dudderar of Unionville, Md., whom address at that place for any additional information desired.

## Telegraphs in Europe

The Swiss telegraph, of which there are 1,130 miles of line, or fourteen miles for every hundred square miles of territory-has been for some years in the hands of the Government. The charge is uni formly one franc, and a quarter franc for every additional ten franc for words, with free delvery by car rier within three miles, or by mai at greater distances. Postal money orders are also transmitted in 'the same way. The number of tele gramsin 1865 was 364,000 , and the proportion of telegrams to letter steadily increases. As the light ning travels up and down and through the snows with equal fa cility, it has a peculiar advantage over the mails in a country like Switzerland.
In Belgium, the telegraph is still cheaper, the uniform charge being only half a franc, or less than one dime for the first twenty words The system has belonged to the Government since 1850 , and every post office is either a telegraph office or an office for forwarding telegrams by messenger or mail as may be desired. There are 2,000 miles of line. Messages ar written on stamped paper, and de livered free of further charge for distance of a mile and a quarter beyond which they may be forwarded express or free by mail If the message does not reach its destination as soon as the mail, or is incorrectly sent, the price is returned. In 1860, at a charge of a franc and a half, there were 80,000 telegrams being one to 218 letters; in 1865, at one franc, there were 332,700 , being one to 48 letters. In December, 1865, the charge was reduced to half a franc, the present rate and the cheapest in the world.
In Prussia, the lowest charge by the national telegraph is about 15 cents. In Paris the postal telegraph system has been tried with success, with a uniform charge of half a franc ; the number of dispatches having increased tenfold within six months after the reduction from one franc to the present rate

## Microscopic.

Mr. Dancer has executed a very curious and certainly minute sort of inquiry into the composition of furnace dust, i. e., the extremely fine powder which accumulates in flues from the burning of coal, apart from sooty or carbonaceous accumulations. He washed the dust carefully, to separate the purely mineral ingredients, and by placingit on a slightly inclined glass, made the spherical particles to separate them selves from those of irregular shape, by rolling down the in cline. These, examined under the microscope, were found to be quite interesting objects. Many of them appear to be perfectly spherical though less than $\frac{1}{100}$ of an inch in diameter, solid or hollow, with a brilliant polish, and in beautiful variety crystalline white yellow, brown, black a ate carnelian of various shades, and some like rusty cannon balls. carnelian of various shades, and some mastly silicates, or various kinds of glass, colored, when not transparent, with different kinds of glass, colored, when not transparent, with different
oxides, carbon, etc. He accounts for their shape by supposing oxides, carbon, etc. He accounts for their shape by supposing that they have been thrown off in scintillations, of course in a molten state, in which by a law of matter they assume a spheroidal form. Many of them appear to be ferrous oxides or "iron ore," probably formed by the action of heat on the iron pyrites in the coal, and afterwards, in many cases, found to have been reduced to metallic iron and encased with an enamel of silicate. Hence the proportion of iron in the coal dust is much greater than is revealed by the analysis of coal ashes.

## MANAGEMENT OF STEEL.

We have given considerable room to communications on this subject, but as it is one which is not surpassed in importance by any other process in the mechanic arts, it is proper that the suggestions and experience of practical men should be laid before our readers whenever they contain any new facts or support disputed theories. Below are extract from three communications, each of them from practical stee workers. The first is from "C. H.," of Collinsville, Conn He says :-
I have read with pleasure the articles on working and tem pering steel in Nos. 7, 12, 15, and 16, current volume, and while agreeng with many of the statements of your corres pondents, there are others to which I should take exceptions the one by "E. M. F.," in No. 16, he says: " We can neither depend upon the degree of polish nor color of surface. The ecret lies in the working of the steel and in the proper de gree of heat given the steel to be hardened." This is true in certain sense, and yet when the steel has been properly worked, and hardened at a proper heat, some guide is neede in bringing it to the right temper, and I know of none so sure as the color. But all tools do not require the same degree of hardness. Take for instance, a bar of steel of the proper quality for wood-cutting tools, and make from it an ax, fram ing chisel, carpenter's hatchet, drawing knife, and turning chisel. Work it carefully, harden in brine as strong as salt will makeit, at the lowest heat that will thoroughly harden it through, wash off the salt in fresh water, scour with a piece f common grindstone, just sufficiently to remove the scale, and draw the temper of the turning chisel to a light straw, merely changing the color ; drawing knife, a bright copper ; carpenter' hatchet, copper with purple spots; framing chisel, purple ; chop ing ax, deep blue; and we shall have tools that will stand any reasonable amount of strain, and carry at the same time of steel is user it will be necessary to vary somewhat from this.
One cause of trouble among the workers of steel is that the do not get steel adapted to the different kinds of tools they make. 'To illustrate this point, some years since I was mak ng cast-stecl hoes. I wanted a pair of blades for trimmin shears, and having nothing else of the right size at hand, made them from a bar of hoe steel, leaving them at the usual temper. But although the steel was of the very best quality of its grade, they would not stand; the edges would roll. hardened them again, leaving them much bigher. Then they ould crumble and after several ineffectual atter mak hem cut I gave it up as a bad job, and made a pair from stee adapted to that kind of work, and afterward had no trouble From my experience of more than thirty years, I am convinced that three things are absolutely needed to make good tools st, steel of a grade adapted to the required tool ; 2nd, a prope working of the steel in making, not heating too hot nor ham mering too cold ; 3d, proper hardening and tempering. Now if any man expects to succeed in the business and make uniformly good tool without proper attention to each of the points named, I think he is doomed to disappointment.
"R.F.S.." alse of Collinsville, the seat of an immense manufacture of axes, scythes, etc., gives some opinions on color and heating. He says:
E. M. F. has a good article in No. 16, but thinks steel should only be heated to a dark cherry red to harden. Now this i too indefinite, as cherries differ materially in color. Eyes also differ in judgingrof color. A cherry-red heat on a forge under the window ond one on a forge in a slady place are two very different heats. Agrain the heat required by high and low steel cannot bo governed by the color of the same cherry, nor can a piece of steel one-eighth of an inch thick be properly hardened with the heat required by a piece one-half of an inch in thickness. lam of the opinion that the only proper test Now we find that the most approved brands of steel are nearl niform in themselves; then we are safe in taking a piece and find the lowest point of heat at which it will receive a thorough hardening and the experienced eye must follow the lead thus indicated, often applying the test to keep the ye right. In the article of "W.S.D.," in May11th, he speaks of tempering by one process, or of giving steel just the desired hardness without the necessity of drawing the temper, but thinks it is a matter of such nicety as to be impracticable. differ somewhat from lim
Assuming that a piece of good steel has been properly forged and the desired refinement given it by a judiciou hammering, my experience is that the steel receives an ad itional refinement by a thorough hardening, and in propor ion as it lacks in being made as hard as it can be by the hardening process, just so much it is lacking in its perfect refinement; and when I speak of steel being made as liard a it can be I repudiate the idea that an extra high heat will produce an extra hardness ; a high heat may produce an extra brittleness which some mistake for hardness, but the fact i such brittle steel will file easier than if hardened at just the proper heat.
"H. G.," of Mansfield, Ohio, gives some practical hints drawn from an experience of twenty years. He says:
In ordering my steel I always state the use for which it is intended, as all know that much depends upon the quality of the material, and we cannot make a fine tool from a coarse steel. Steel should never be heated above a degree sufficient to work it into the required shape; at the same time it should never be hammered when lower than a cherry as it becomes hard and brittle, and in most cases will check or become flawy. When hardened, stecl should be worked in a good
clean fire (charcoal fire is the best) and should be hammered clean fire (charcoal fire is the best) and should be hammered
sufficiently to thoroughly work the steel, but should neve
be drawn from a large bar to a small one, as it will invariabl crack or spring in hardening; it should be hammered a mooth as possible, especially when it is to be hardened with out finishing, as a smooth piece of steel is less liable to crac in hardening than one that may be full of hammer marks of cales. When heated to harden, heat very slowly and just suf fiently to take the temper, and when plunged into the wate nder no circumstances should it be withdrawn until cool, or ot one degree above the water in which it is plunged, as it will crack and fly then'if ever, and there are several instance where people have lost the use of an eye by withdrawing stee rom the water before it was thoroughly cool. After the steel has been hardened it should be polished even and fine, always in one direction, and be drawn as slowly as possible, and or the finer qualities of work should never be cooled while rawing, but should be diawn gradually enough to lay it down and let it cool off without checking, as it will make it ougher, and not so liable to crack. Many smiths use tallow to bring out the color, but the utility of this I very much doubt except in some few cases where the work is very small and ifficult to polish. I think, owing to the difference in stee and the nature of the work for which the tool is intended hat the exact color cannot be laid down with any degree o ccuracy and is only to be ascertained by experience and care ful study of the nature of the steel and the work to be per formed, as the lower the steel the higher temper it will bear with safety and vice versa. After all my experience I have come to the conclusion that it is an impossibility to make temper
boiller feed fipes, check valves, and cast-iron HEADS.

From a correspondent, G. W. D., of Providence, R. I., w have received some account of a boiler explosion which latel ook place in Massachusetts. One of the boilers in a nest o eight, burst, displacing the remaining seven and carrying de truction in the path of its fragments. The boiler was rent in two parts, one part imbeddingitself in the chimney and the other flying two hundred feet, cutting through a telegraph pole, damaging a railroad embankment, tearing up the rails and plowing a furrow in the ground, after striking, two feet deep and two hundred feet long. The superintendent of the works attributed the explosion to excess of water in the boiler but our correspondent thinks it was occasioned rather by ab ence of water.
The nest of boilers was fed with water by a common pipe aving branches leading to each boiler, and one check valv on the main pipe between the pump and nearest boiler. Our correspondent believes that unequal firing disturbed the equilibrium of the water; in other words that firing under one boiler more than under another will create a greate pressure of steam in that boiler, forcing the water out into most intense heat without an adequate supply of water.
He approves of introducing a check valve to every boiler to revent the water from being driven out of one boiler into another, and, better than that, to employ competent men to manage boilers in sets.
It seems as though there could be only one place to which the check valves could be appiied, and that would be in the branch pipes leading fromthe main feed pipe to each boiler If placed in the main horizontal pipe they would prevent the water from backing into one boiler, but not into that on the
other side. If the water-feed pipes are large enough and the connection between the steam spaces ample, it seems ther hould be but little trouble in equalizing the pressure and the level of water in the different boilers without any check valves. Preferably, independent feed pipes to each boiler should be employed; then each boiler could be treated as a separate generator. If not, would it not be well to introduce ocks between the boilers to be attended to by the fireman or ngineer? Sometimes one or two boilers of a nest are use wile the others semain idle. In this case there is a mean to stop both water and steam communication between those use and those at rest. Under such crrcumstances th equilibrium must depend upon the knowledge, carefulness and attent
A similar explosion to that mentioned by G. W. D. is de scribed by a correspondent from Jacksonville, Fla. In this case the boiler that exploded was the middle one of three plain, cylindrical boilers, forty feet long and forty inches di meter. The cast-iron head blew out, the disk cut from the flange as evenly as though turned off in a lathe. The head iself merely blew out and lodged at the foot of the chimne directly behind the boiler, while the shell went at least thre undred feet, cutting timbers off clean and dragging its two companions from their beds about their own length. The writer attributes the blowing out of the cast.iron head to its vibration by alternate expansion and contraction, or bulging by being heated during the day and cooled during the night This is undoubtedly the reason why it gave way as it did, but why should that particular boiler head yield and not ither of the others? More internal pressure was exerted on his boiler than on the others or all would have gone and at the same time. Our informant does not describe the mean only says "there was abundant means of communication both for water and steam between all these boilers, and no greate ressure could exist in one boiler than in the others." The xplosion took place in the morning before the machinery had been put in operation. The watchman states that there wa plenty of water and the steam gage stood at seventy pounds
three gages of water, and our correspondent deemed the sound of the whistle which he heard a few minutes before the ex plosion not to indicate a high pressure of steam. All this may be and yet there may be circumstances in regard to the com munication between the boilers which are not mentioned by our correspondent which would, in a measure at least, affor probable reason for the explosion. We knew a case wher boiler in a set was exploded when ample means of communi cation existed, but the steam and water connections could bo closed by cocks. Notwithstanding the asserverations of the freman, it was evident that the exploded boiler was withou proper supply of water. If the steam communication was losed and the water communication open between the diffe ent boiters, and one boiler was fired harder than another, it would not require a very great preponderance of steam pres ure to empty the water from the heated boiler into the others. leaving that one in a most dangerous condition.
As to making cast-iron heads thick enough to prevent pringing, it may be questionable whether this would be as effectual and economical a remedy as making them of wrought ron and of hemispherical form as is the practice in England This is a far better form to resisti nternal pressure than the flat disk head. In flue boilers the flues themselves are ustiall he only stays employed in retaining the heads in position but the expansion of the flues is sufficient to exert an enormou frce on the heads. It is no wonder that explosions occur from this cause; the wonder is that they are not more frequent.

The Repeating and Breech-loading Riffe.
Captain Majendie, an assistant superintendent prominent y employed in the trials of arms and ammunition in En gland, lately delivered a lecture before the Royal Institution in which he reviewed the progress of breech-loading rifles concluding with the decided opinion that the final solution o he problem would not be reached until the magazine or re peating rifle should be so simplified and perfected as to mee all exigencies of service, at the same time as a single loade while carrying its magazine complement ready in reserve The alteration of the Spencer repeating rifle to meet this re quirement was the subject of an interesting trial on the $26 \pm 4$ of April, at Vincennes, France, where it is reported to have elicited the warmest approbation from the French military uthorities, none of whom were previously well disposed to ward it. In fact, says the Mechanics' Magazine, the only draw back to this arm for general military purposes, has been that it could only be used as a repeater, and now that it can be sed thus or as a direct breech-loader, at will, the French au horities are convinced of the efficiency of the rifle every way the remarkable accuracy and unparellelled rapidity of fire-? hots a minute-having extorted unqualified admiration.
Very interesting characteristics of warfare with the Indians, as modified by this weapon in the hands of our troops, ar recalled from the testimony of Lieut. McMurray, of the 1 st artillery. One day in the fall of 1865, two mountain men and nine soldiers, armed with this rifle, fought their way steadily on foot through an encircling force of not less than 1200 to 1500 Sioux and Cheyennes. The moral effect of the constan fre from so few arms, and its accuracy at long range, kep he Indians out of arrow range as effectually is the dreaded "shooting wagons" of the artillery, and the party regained he command without a wounded man. On another occasio wo men out hunting were pursued by twenty or twenty-fiv ndians: one of them was killed, but the other took shelter in a little gulch and commenced pouring in his fire from the magazine rifte, and after killing and wounding four Indian and two horses, the rest galloped a way, when he pursued his way to the command unmolested. The Indian bow is mor deadly within range than any non-repeating rifle, as they can handle their arrows rapidly enough to keep from live to seven in the air following one another at once, with an almost un rring aim. But the Spencer rifle is too much for the bow, from its equal rapidity and longer range; and too much for he archer likewise as yet, for the Indians have been seen to ick up the rifles of men they had killed, load them by the muzules, and after many ineffectual attempts to fire them, throw them away

## The core Viaduct

This fine structure, crossing the valley of the Cere and car rying the Paris and Orleans railway at a light of $181 子$ fee from the water, is another and more complex and lofty spec men of the modern style of bridges supported on tubula piers. Each of these consists of eight cast iron columns, grouped in an ellipse, united by cross bracing, and resting on base of brickwork. The piers taper upward from a base of bout $8 x 16$ feet, at the rate of 1 in 30 toward the major axi nd 1 in 15 toward the minor axis of the ellipse. Thei ights, we are unable to state precisely, but the highest can ot be far from 150 fect. There are five spans of lattic irders, the three central spans being 164, feet each, and the nd spans 145 and 139 . The abutments are of stone. The rection of this viaduct was conducted in the same bold mat ner as that adopted at Fribourg, the girders being first put to gether on the abutments, and then pushed forward until the verhanging ends were over the brickwork base of the firs of the iron piers to be erected. They were then braced, an used as the jib of a crane for hoisting into place the succe sive joints of the tall iron limbs upon which they were to rest When one of the piers was thus completed, the girders wer gain pushed forward until the foremost end rested on it and rojected forward over the base of the second pier, and th me process as before was repeated until the structure wa complete. The total cost was about $\$ 150,000$

Iodide of Silver possesses the singular property of con tracting by heat and expanding by its withdrawal.

## Editorial summaxy.

A Subterranean Water spout.-A remarkable irrupA Subterranean Water spout.-A remarkable irrup-
tion of water took place recently in the Cole silver mine, Virtion of water took place recently in the Cole silver mine, Vir-
ginia city, Nevada. The tunnel is a little over 1600 feet in ginia city, Nevada. The tunnel is a little over 1600 feet in
length and perfectly straight. Several successive outbursts of water have rushed through the tunnel, the last filling it up. with rock for a distance of nearly 100 feet. At the last accounts, this had been cleared out by the workmen except about ten feet, and but little loose rock was then coming in; although a large stream of water, about thirty-five inches, was still rushing over and through the pile of loose rock obstructing the tunnel, with a loud roar, occasionally accumul ating its force and thrusting the mass partially forward. A large cavern must have been formed at the head of the tunnel, as hundreds of tuns of rock have come from it ; but it has not yet been explored. A curious effect is noticed from throwing in the daylight to the head of this straight tunnel by means of a properly placed mirror at the mouth. Persons at the further end are plainly distinguishable and whether dressed in black, blue or any other color, appear as white as snow-a ghostly sight.

Modern Gems.-The progress of human skill in the imi tation of precious stones, and the gradual giving-out of the diamond mines of Golconda and India, have rendered spurious gems more abundant and more perfect in imitation than ever. Even expert connoisseurs are said to be sometimes deceived by certain classes of imitation gems; and so far as this is the case, the advantage of the genuine stones over the spurious in a merely ornamental point of view, has certainly been reduced to a very fine shade. A recent work on the subject states that
but a small proportion of the gems now sold and worn are genuine, and that large quantities are made in Birmingham genuine, and that large quantities are made in birmingham
and Paris, sent to India, and sold by the natives to strangers and Paris, sent to India, and sold by the natives to strangers
as "gems from the mine." The steady progress of science in as "gems from the mine." The steady progress of science in
the re-composition of natural products leaves little room to doubt that man will eventually conquer this field also from nature and occupy it with more exquisite products of art.

Silver Mica.-Puscher, of Nurnberg, has adapted mica very beautifully for decorative work, such as inlaying and metal-coloring. After purifying it by treating in thint sheets with a strong solution of sulphuric acid, it is silvered exactly like a looking glass, and appears like a most brilliant film of metal. The ease with which it is cut in shapes and laid superficially, together with the splendor of its appearance, may be imagined. For a dead silver white, it is heated to redness in a clay muffle-after cutting into the shapes requiredwhen it loses most of its flexibility, and becomes white, but in single sheets remains partially transparent and flecked with gray spots. The latter, with the transparency, disappear when two or three pieces are laid together. Small fragments of it, or finely ground, may be sprinkled upon a freshly poured shest or coating of gelatine, and then fixed by a varnish, with beautiful effect.

Velocity of Steam and other Gases.-Mr. R. D. Napier has demonstrated to his own satisfaction and that of others first theoretically and afterward by experiment, that the' velocity at which steam will flow from a boiler through an orifice into a vacuum, is rather less than half of that given in all published tables, and that it is no greater into a per fect or partial vacuum (at a pressure of two or more atmo-
spheres) than into the air. The general law is established, that a gas of any given pressure will rush into a gas of not more than half that pressure, at the same rate as into a vacuum.

Bernabe's Iron Coppering.-Admiral Viscount de Cha bannes, at Toulon, writes in a published letter that not only is the adhesion of the iron and copper by M. Bernabe's process as employed in the arsenal of Toulon, so perfect that they are not started apart by hammering, bending or breaking, but that if a hole in the copper at any time occurs from abrasion, the part can be re-coppered on the spot, as effectively as before. If this means that a repair of this kind can be effected on a ship's botiom, the method may very well have all the value attributed to it.

The Hydraulic Propeller.-We observe that Admiral Elliott, in a paper read before the Institution of Naval Archi tects, has come out very strongly in favor of the " Waterwitch" principle as the future motive power for ships of war. He was as strongly sustained in the ensuing discussion by Sir Edward Belcher, and warmly encouraged by Mr. Scott Russell while Mr. Reed, Chief Constructor of the Navy, and others, opposed. Mr. Rassell predisted that with time and perseverance the plan would certainly succeed in the end, and supersede the screw for the purposes of warfare.

The Improvement of the Rione is prosecuted vigorously by the French Government. At nine points the river has been or is now being straightened, widened or deepened, as the case required, so as render navigation safe and unimpeded All effiorts to improve the natural channel at the mouth having failed, a canal two miles long has been cut for an outlet to the sea; issuing from the river by a lock 500 feet long and 70 piers, each three quarters of a mile long.

Miscellaneous.-Iron at an intense red heat is transparent to a slight depth.-TThe British Government have awarded Major Palliser $\$ 50,000$ for his improvement in projectiles and propose to ask half as much more for him in their next year's estimates.

Ingenious Light Draft Sleamers.-A late paper by J R. Napier explains the construction or the Godavery river (In dia) of a length of some 140 feet by 25 feet wide, and only one foot draft. The bottoms are made of gaivanized cast steel plates only one eighth of an inch thick, fastened to longitudinal frames two feet apart. 'To stiffen a hull so long, gitudinal frames two feet apart. 'Co stiffen a hull so long,
light and shallow, the awning necessary under the tropical light and shallow, the awning necessary under the tropical
sun and rains, is made of galvanized one sixteenth inch steel sun and rains, is made of galvanized one sixteenth inch steel
plates, on frames similar to the bottom, but lighter and closer, plates, on frames similar to the bottom, but lighter and closer,
and is made virtually a part of the hull, being connected with the vessel's bottom by two steel latice frames placed about two thirds of the width of the vessel apart, and the whole structure is stiffenea laterally by steel angle bars and diagonal braces. The propeller being at the stern, the boiler and fuel are placed in the forepart of the vessel to balance it. The engines consist of a pair of 11 inch cylinders with 4 feet stroke, supplied with steam at 150 lbs . pressure by a boiler nearly like that of a locomotive. The paddle arms are of wood, of a radius of $3 \frac{1}{2} \mathrm{feet}$, and have no rims or floats. Except a short forward deck for a steam capstan, warping pulleys and anchors for getting off sand banks, they are open boats, with a light floor of wood laid on the bottom frames With $2 \frac{1}{2}$ feet of freeboard and 1 foot draft, their depth will be about $3 \frac{1}{2}$ feet.
Concerning Sound.-The transmission of sound through olidemetallic tubes is so perfect that conversation has been maintained in a low tone between the ends of one of the Paris water pipes 3,120 feet long. The velocity of the transmission of sound is greater, by four to sixteen times, in metals than in air, and in wood, as computed by Chladni, from ten to sisteen
times greater ; ${ }^{2}$ which is not so commonly known. Rock contimes greater ; ${ }^{2}$ which is not so commonly known. Rock conveys sound so much faster than air that the ear applied to a will per rock in which blasting is conveyed through the rock first, and afterward the ordinary report through the at mosphere. It has been found that the velocity is also pro portioned to the loudness of the report, other things being equal. With 2,000 pounds of powder a report travelled 967 feet in a second ; with 12,000 pounds, 1,210. The most notable observation lately made in the direction of reducing sound to form and measure, is the refraction of it by M. Sondhaus, by means of accoustic lenses made of spherical collodion en velopes filled with carbonic acid
The Boxer Shrapnel Shell.-Shrapnel is a spherical shell filled with powder and bullets. In the old kind the powder and bullets are mingled : the improved segment shell adopted in 1859, separates them, obviating the tendency to burst in or near the gun from the mutual collision of the contents on beng discharged. The Boxer scrapnel is a cylindrical iron case with the powder in a chamber at its base, where the walls are thick, and some 450 iron bullets in the forward part ; thus resembling substantially a loaded cannon in itself. A trial was made at Shoeburyness, April 26th, to test the comparative effects of the improved shrapnel of 1859 and Colonel Boxer's invention. Three targets were placed one behind another, that infront presenting a surface of 9x54 feet. The Boxer, fired from a 9 -inch gun with 30 lbs of pow-
der, sent 142 balls through the front target, 46 of these through and 60 into the second target, and 26 of the latter through and 6 into the third target.
Gun Cotton has now taken a well-defined place in commerce and utility, and its manufacture has been so far perfected that its definite quality is as certain a result as that of gunpowder its liability to spontaneous explosion has been obviated and the rapidity of its combustion can be accurately regulated, It owes its present position to the combined exertions of three
parties: Major Von Lenk, of the Austrian army, Mr. Abel of Woolwich, Eng., and Messrs. Prentice, of Stow Market The spontaneous chemical changes which have led to disas trous explosions, are characteristic of lower compounds, very small percentage of which is liable to form under certain conditions in the tri-nitro-cellulose which constitutes the most perfect form of gun cotton. This is now prevented by Mr. Abel, by adding a little carbonate of soda which netralizes the first result of change, consisting of a little nitrous acid and all further decomposition is thus obviated.
Daw's Metallic Cartridge-specially designed for breech loading rifles-is cased in thin rolled brass, formed around a mandrel with two turns, the end cemented down, the base united with a metallic cover, and the whole made completely impervious to water. This cartridge is extolled in the English journals as the best, surest, cleanest, lightest and cheapest ye made.
a Well-ventilated Measure.-The English journals in form us that on the night the reform bill was introduced $1,500,000$ cubic feet of air, comfortạbly warmed, passed through the House of Commons every hour. Fifteen miles of steam pipes are used in warming the two Houses.

## bUSINESS AND MANUFACTURING ITEMS.

Cotron.-A French stocking machine now on exhibition is made to notify its attendant of the breaking of a thread by a very simple arrangement; each thread sustaining a small steel lever which drops when the thread is broken, so as to complete an electrical circuit and cause the striking of a bell. Iron.-The reported failure of the Paris Bessemer steel bridgeis denied emphatically. The apparent deflection of the J. Campbell Evans, of the Morden Iron Works, East Greenwich, Eng., has made a machine which rolls screws by means of three circular dies, set with the proper pitch, in such a
manner as to rotate the red-hot bolt between them and shape by their edges.
Mining.-The cost of English coal in human life in five years was, from 1856 to $1860,5,089$ lives for $381,000,000$ tuns from 1861 to $1865,4,627$ lives for $468,500,000$ tuns.- Iridium is said to le among the minerals found in connection with gold in the Richardson Mine at Madoc, C. W. It is also found at Chaudiére, together with platinum. It is a rare and valuable metal, of extreme hardness, and is in demand for pointing gold pens.--TThe falling off in the Australian gold fields has prompted the authorities of Queensland to stimulate new discovery by offering a reward of $\$ 15,000$ for the discovery of any new gold field not less than 20 miles distant from any other alpeady proclaimed within the colony.
Ramboads.-It is proposed to consolidate the St. Louis and Iron Mountain Railroad, which runs southward from St. Loui through the great metalliferous region of southeast Missouri with the Cairo and Fulton, which is designed to run from a junction wiih the former road to Cairo ( 30 miles from Cairo west having been heretofore completed), and thence to be ex tended southward to Belmont, opposite Columbus, Ky., which is the terminus of the Mobile and Ohio road. Some 100 miles of the line are yet to be built, though partly graded St. Louis will thus get a direct connection with the whole southern system of railroads, and a route to New Orleans 700 miles long, or 500 miles shorter than by the river. So says the Railroad Journal.-Further particulars of Robertson's (Nevada) track-laying machine-pronounced in San Francisco complete succass-show the motory arrangements mor clearly than we were enabled to obtain them from an imper fect newspaper report, a few weeks since. The leading necessity, a road for the machine that makes the road, is pro vided by placing the levelling, tie-laying and track-laying machinery forward of the trucks, on a projecting portion of the frame, forty feet long. The whole frame, 60 feet long, resembles the skeleton of a lattice bridge, and rests by its last 20 feet on low car trucks, over which are placed the engine and boiler, and the load of ties and rails. The latter are passed over the machinery as fast as wanted by endless chains and overhead travelling cranes, and laid as heretofore de scribed, forming the track upon which the machine moves forward, while a tender train brings up the fresh material without interruption of the work. It requires only 20 men and lays track at the rate of six to twelve miles a day.-The Mont Cenis tunnel having passed through the quartz and en tered upon a softer stratum, now proceeds much more rapidly It is now more than half done, 4.129 miles having been tun-
nelled, leaving 3.461 miles yet to be bored.-The Russian nelled, leaving $3 \cdot 461$ miles yet to be bored.-The Russian
Government is making surveys for great lines uniting the Baltic to the Black and Caspian Seas.-It is stated that a line of steamships is to be established between Hamburg and As pinwall, commencing with monthly trips. Direct emigration to the Pacific coast as well as direct trade, from Germany, may probably be stimulated by such an enterprise.-A first-class carriage on the Great Northern Railway (Eng.) caught fire on the 26 th of April last, when at full speed, and burned for fully ten minutes, until it became wrapped in flames, before the distressing situation of the passengers was discovered by the guard. Their signals, shouts and shrieks (a number wer ladies) were of noavail whatever. Where were the rockets

Miscellaneous.-A commission appointed by the legisla ture of Maine is engaged in investigating the problem of re storing and preserving the fish, which have disappeared from the streams to a great extent in consequence of the erection of dams and manufacturing establishments.-Brown coal, o lignite, has been found in considerable beds in Middlesex county, New Jersey, between Keyport and South Amboy The proximity of this coal to the city of New York, where it is calculated that it can be delivered at a cost of not over $\$$ a tun, will render the beds very valuable property, even if the coal is none of the best.-The Boston Fruit Preserving Com pany freeze fish solid in their establishment in a few min utes, and preserve them for an indefinite period. It is sup posed that a large trade will be done in frozen and preserved fish. It is proposed to pack salmon in this way in the sum suer, when they are cheap, for winter sale.-A Los Angeles, Cal., olive-grower sold last year from seventy trees, occupying about $1 \frac{1}{2}$ acres of land, 2,800 gallons of oil for $\$ 1,400$.-Cora for jewelry is said to hate risen in value within five or six years from five dollars an ounce to one hundred ; five or six times its weight in gold.-The Caledonian Mercury, established in 1662, and which claimed to be the oldest newspaper in Great Britain, on the 20th of April ceased to be published, after an existence of more than two centuries.-Coal is hereafte to be used exclusively as fuel on the New York and Erie Rail road, and the company have commenced selling off the wood they have on hand.--The New York City Railroads conveye in 1866 nearly a hundred millions of passengers ( $93,907,682$ ) A shoal of from 150 to 200 bottle-nosed whales visited Mussel hurgh Bay, Scotland, on the 20th of April last, and were at tacked by the Frith of Forth fishermen. After an exciting and protracted battle, witnessed by hundreds of spectators 25 of the whales were brought ashore, measuring from 9 to 25 feet in length.-A rich lode of bismuth has been discovered in
South Australia, 200 miles in the interior. The product of the mine has commenced arriving in England.-The Franco American Telegraph bill has been approved by the Governor of New York, and a certified copy has been dispatched to France where the Imperial Govermment, it is said, is ready to promote the enterprise in the most substantial way. The grantees are required to have the line in operation in two years; which is rather short notice.-It is said that a million of dollars is annually made by the sale of Florida cedar wood for lead annually

## Sricute fumiliatly zatustated.

## What Is Petroleum?

The crude petroleum of Pennsylvania always issues up out of the earth mixed with inflammable gas. This gas makes an excellent fuel, and is much used for generating steam for the pumping engines. It is abundant enough to run all the en ines in the oil district
If the gas as it issues out of the wells be subjected to pressure or to a temporature of zero, a considerable percentage of it will be condensed into a liquid, the amount con densed being somewhat proportioned to the pressure and cold Some of it, however, refuses to condense at any pressure and cold which we can command, and such is consequently a per manent gas. That which condenses assumes the form of gas again as soon as the pressure is removed and it is exposed to ordinary temperatures. The change into gas or vapor is very rapid and violent, and in fact is a case of boiling. Some of the volatile liquids will boil on ice!
It is evident from these statements that petroleum gas is in fact a mixture of several gases and vapors, which may be separated from each other by careful management of pressur and cold.
We may likewise demonstrate the fact that the liquid crud petroleum is a mixture of different liquids. The partial sep aration of these may readily be effected by distillation. Th oil which first appears on distillation is very light in gravity and has a low boiling point. As the distillation progresse the gravity and boiling point increase with remarkable regu larity ; from the beginning to the end there appears to be a onstant and regular progression.
The reader is now prepared to apprehend the fact that pe troleum is composed of a series of substances having proper ties which differ from each other only in degree. There is a be ginning and an end, or top and bottom of the series, and be tween them regular gradations of intermediates. The be ginning or top of the series is a permanent gas; the bottom or end is a solid. Between these are gradations of consisten cy, gravity, and volatility.
In an arithmetical or geometrical series there is always peculiar difference between consecutive members of the series: piven one member of the series and that peculiar difference and the whole series may be determined, or any particula member of it. Is there any such certain and interesting re lation between the members of the petroleum series.

The only chemical elements which enter into petroleum are carbon (C) and hydrogen (H). (Water, sulphur, nitrogen, compounds, etc., which are often found in crude petroleum are properly regarded as foreign substances.) Now it is evi dent that the members of the series must differ by varying proportions of these element
The beginning of the series has been found to be composed of two atoms of carbon $\left(\mathrm{C}_{2}\right)$ with four atoms of hydrogen $\left(\mathrm{H}_{4}\right)$ the beginning of the series is represented thus- $\mathrm{C}_{2} \mathrm{H}_{4}$. Now it happens that this substance $\mathrm{C}_{2} \mathrm{H}_{4}$ to chemists is a familiar acquaintance. It is commonly known under the name of marsh gas, and is known to coal miners as fire damp. The second member of the series is $\mathrm{C}_{4} \mathrm{H}_{6}$, and the third is $\mathrm{C}_{6} \mathrm{H}_{8}$ The reader hardly needs to be told that the fourth is $\mathrm{C}_{8} \mathrm{H}_{10}$ and he is able to determine the twentieth. The common dif ference of the series is $\mathrm{C}_{2} \mathrm{H}_{2}$, and the general formula for th series is $\mathrm{C}_{\mathrm{n}}+\mathrm{H}_{\mathrm{n}+2}$.
We append a table showing the specific gravity and boiling point of a part of the series. The first four are gaseous a ordinary temperatures, and the specific gravities are given in comparison with air:-


A National Survey.
The survey ordered by Congress, under the direction of the Secretary of War, of a belt of land extending from the Rocky Mountains to the Sierra Nevada, on the route of the Central Pacific Railroad, will probably be commenced by the first of July. The exploring party, to which we have already re ferred, headed by Mr. Clarence King, who has had several years experience as a mountain explorer, in connection with the State Geological Survey of Califorria, has already started for the Pacific Coast. Among the nine assistants, as we learn from the Nation, are Mr. James T. Gardner, who has lately been engaged with Mr. King in surveying and mapping the Yo Semite Valley and the adjacent mountain region, as firs assistant in topography, and Professor James D. Hague of the Massachusetts Institute of Technology, likewise an ex perienced traveler, as first assistant in geology. There ar also two other topographers, two other geologists, and a zoologist, a botanist and a photographer. On their arriva in California, a squad of twenty-three mounted Californians,
under non-commissioned officers, will be detailed as a military escort, and with six drivers and packers will make up party of thirty-nine
The proposed line of exploration extends about 1,000 miles by 100 broad, from Pyramił Lake, near Virginia City, on the eastern slope of the SierraNevada, to Denver City, on the east ern slope of the Rocky Mountains. The party hope to go thi year, as far as Fort Riley, and spend the winter in the neigh borhood of Virginia City. Next year they hope to reach Salt Lake City, and their work out of doors is to be completed i the third year.

## BROWN'S FRUIT GATHERER.

In picking fruit trees the danger of climbing and of as ending ladders detracts much from the pleasure. To be sur "when the pear is ripe it will fall into our hands," if our hands are in the proper position. But in the engraving is shown a very simple fruit gatherer by which one may stand on terrafirma and exploiter the denizens of the orchard. It is merely a bag for the reception of the fruit secured to a pivoted frame of wire, which when the cerd is pulled, closes against the edge of a curved plate. The operator holds the talf to which the apparatus is fixed, in one hand and pull the cord which operates it, with the other


Placing the aperture so as to envelop the fruit, he merely pulls the cord, when the fruit is separated from the branch and drops in the bag. For the picking of fruit designed to eep, much care is required, and those which fall to the round by the force of the wind or the violent shaking of fruit for market these injuries are elements of deterioration, and the fruit, whether apples, pears, peaches, or high growng and lasting fruits, should be presented to purchasers in he best possible state.
To secure these results is the design of the inventor, Mr. Wm . Brown, who patented his invention Feb. 5, 1867, and may be addressed at Box 1,021, Worcester, Mass.

## TAYLOR AND LAFFERTY'S BROOM HEAD

Metallic heads by which the broom corn can be attached to he handle are coming into common use. They are economi cal, although costing somewhat more in the first instance than he common brooms, because the handle and head need not be thrown aside soon as the corn is worn to stubs, but by a simple replacement of the comparatively cheap fiber the worn out implement becomes again a broom.


The head in the engraving is of sheet metal, fastened at the op to a block through which is a hole for the reception of th andle. The handle tapers to the end, which is received in he socket of the yoke, through which pass two screws on each side of the handle, having on the outside of the case two metal braces for stiffening the box. The broom is introduced
into the head, the butts being placed on each side of the central bar or yoke, until the head is filled, while the screw are slacked. These are then screwed up and by compression hold the broom very securely. It makes a light and handy mplement.

A patent for this device was issued Sept. 11, 1865, to J aylor and R. M. Lafferty. For other information relative to it address J. E. Prutzman \& Co., Three Rivers, Mich.

## Exposition Notes.

The Logomotive Gold Medal.-A letter in the Boston Journal gives the following circumstance connected with the award of the gold medal to the Paterson engine " America: The Austrian and French members of the jury took exception the "America" because it was so light in some of its parts. But fortunately the English member of the jury is well in formed on locomotive engines and American engineering, and he explained that the railroads in America are of an entirel different construction from European roads; that the country is new, and the roads cheaply built, and the ties are subject o displacement from frost; that to ride over rough road here must be elasticity in the machinery; that American en gineers had difficulties to contend with wholly unknown to Europeans; that, taking all things into consideration, the American locomotive was superior to any other in the exhibi tion. His arguments were so convincing that the other juror gave way and awarded the gold medal to the "America. This is a great triumph, and it has been achieved through the intelligence and honesty of the English juror
Among the models, Thomas Dunn, of Manchester, illus trates a mode of erecting a steel bridge, by weaving straigh bars into a self-supporting structure progressing from the shore, without supports or scaffolding.
A Paris firm exhibit a machine automatically cutting jointing, punching, countersinking and finishing sixty brass hinges per minute from the sheet metal.-Another Paris ma chine cuts cylindrical lucifer matches, ready for dipping, a the rate of one or two boxes per second. It consists of a slide carrying a row of parallel cutting tubes, made of a solid piec of steel, oscillating very rapidly, and cutting a row of matche t each stroke from the surface of a block of the proper length A series of cutters on the same slide multiply the production to any desired extent.
The English Society of Arts have made a handsome appro priation, and appeal to the public for funds, to aid artizans to visit the Exposition : a portion of the allowance being payable on the reception and approval of a report upon some objec exhibited relating to the art or craft of the workman. Th Lords of the Committee on Education have also proposed an allowance of $\$ 25$ toward the expenses of any master engaged in schools of science and art under their direction, who may wish to visit the Exposition, coupled with a condition simila o the above, and with the addition of prizes of $\$ 100, \$ 75$ and $\$ 50$ respectively for the best three reports in each department (science and art).
T. Labat, of Bordeaux, exhibits a patent slip for drawing ship out of water, consisting of a cradle horizontal on its upper surface, whereon the ship rests and thus retains he atural position, but with the under side parallel to the in line of the ways on which the whole is drawn out of th water. It runs on wheels traveling ten pairs of rails, and is drawn out of water with its load by ten long screws.
The French Government exhibits a model of a submarine orpedo boat, propelled with a screw by compressed air. The roof is recessed to receive a small boat with a water-tight deck and manholes in its deck and bottom, and there is also n intermediate chamber, with manholes, beneath the reces which the boat rests and having a water-tight connectio with the boat: so that ingress and egress for the crew of the ubmarine vessel are practicable in comparatively rough water
The "Carré" Freezing Apparatus has been set upin the park, to supply ice for the restaurants. It consists of a sor of boiler, in which ammonia is volatilized by heat until it reaches a pressure of five or six hundred pounds to the squar nch, and by its sudden emission produces intense cold.
Among the outside objects is a chime of forty-three fine ells, weighing from 40 to 5,000 lbs. each, made for the cathe ral at Buffalo, N. Y. The tunes are played by a great organ barrel, $4 \frac{1}{2} \times 6 \frac{1}{2}$ feet, and pierced for 6,000 pins, with which great variety of airs can be set, the musical machine being actuated by a $2,500-\mathrm{lb}$. clock weight.
Breval's Tan Press, which is on exhibition, is said to be capable of extracting instantaneously about 60 per cent of iquor from the bark, and of getting through with about 66 cubic feet of barkin an hour and a half, employing one horse power.
A Steam Drying Drum for cotton goods, by Turpin, of Rouen, is readily adapted to any width of cloths, from three to six quarters, and dries 600 yards per hour.
The Industrial School of Tournay sends to the Exposition a pair of vertical engines, about 20 horse-power, the designs, patterns, castings, and the workmanship throughout, made by the boys of the school, who are from 16 to 20 years of age It is felt that this visible illustration of itself gives a strong impulse to the idea of industrial schools in every country in Europe-we hope it will in America.
Parisian working hours are remarkably early-two or hree hours earlier even than the English, it is said-and hence the day's work is done and the population are in the treets, gaily enjoying themselves, at an hour in the after noon which in other countries is as busy and humdrum as any other in the day.

The Lords of the Council on education have made arrange ments for the conversion of the Museum of lrish Industry Dublin into a College of Science. It will have ten profes sorships, seven of which already exist.

## white's washivg machine

The engraving is a perspective view of a machine whieh combines the operations of washing and wringing clothes, or which can be used for either of these purposes separately. It was patented through the Scientific American Patent Agency by Cassius A. White, of Fairfield, Vt., Feb. 26, 1867.
The apparatus is a rectangular box raised on legs to a hight convenient for operating, the front legs of which are furnished with castors or trucks by which it can be readily moved from place to place about the house, being wheeled in the manne of a barrow by means of pivoted handles at the rear end-not shown-which may be swung out of the way when the ma chine is in operation. Between upright standards forward of the center are hung two frames, the outer one, A, being piv-

oted to the uprights by a round bar, B , which serves also as a guide to the lower portion of the inner frame, C , in perform ng a vertical sliding motion, by means of slots in its sid bars. The lar, D, is secured to the frame, C, and its projec ing ends traverse in slots in the side bars of the frame, A Two motions are given to both these frames by means of the crank shaft, E, which passes through a box in the ends of the cross bar near the top of the frame, C , and is driven by the fly wheel and crank, F ; one is a reciprocating motion to the frame, C, and the other a swinging motion to both $C$ and $A$ The lower cross bars, G, of the frames have faces of rubber, between which the clothes pass and by which they are cleansed from dissolved dirt. These faces of rubber are adjusted near together or apart by a serew, $H$, which depresses or raises the frame, C, on the shaft, E. These constitute the washing arrangements; but the washing frames may be driven by the crank, I, while the wheel, F, may be placed upon the driving shaft, J , of the wringing rollers, as desired. These wringing rollers are of the ordinary construction, geared in the usual manner, and driven by the pinion attached o the fly wheel, F , through the medium of the large gear, which is attached to the upper roller. There is a device for passing the clothes as they are washed to the wringer by means of belts, K , which traverse through suitable guides over a series of upper and lower rollers, so arranged that the reciprocating motion of the washing frames delivers the clothes to the belts, by which they are passed between the wringing rollers. The motion of the rollers carrying the conveyor belts is assured by gears connected with the prime mover, F.
Although, from the description, the machine may appear complicated, it is in reality very simple, and there can be no straining or pulling of the clothes. When one portion of a piece needs more rubbing than another it can be done by adusting the pressure on the rubbers or turning the crank, F, back and forth. The compression of the wringing rollers is regulated by the lever, L, which turns a shaft having a cam on each end to raise the boxes of the lower roller.

## New Species of Swindling.

A new and successful kind of swindling has lately commenced, and been carried to such a profitable extent that a party of swindlers who have been brought to trial at Middletown, and Minisink, N. Y., had, as it is supposed, realized $\$ 150$ 000 , twenty-five to thirty wagons, and from sixteen to twen? ty horses, before their arrest.
Proceeding to the country, the swindlers take different towns, and circulate among the farmers, to whom they offer patent rights of articles of ready sale. They represent the retail prices of such articles to be double or treble their cost to manufacture, and to show their confidence in the large profits that the farmers can make, they agree to sell the patent right for the note of the farmer, payable in one year and that if he, the farmer, does not make profits, they will take back the right free of charge. If the farmer consents the swindler draws up the note, which the farmer signs, and in some cases, the swindler endorses the condition of pay ment upon its back.
When the parties separate, the swindler trims off the edges of the note with scissors, when the back separates from the ront, the back having been neatly fastened to the front pape by mucilage upon the edges. Having thus rendered the note plainly negotiable, the swindler proceeds to the next farmer or merchant and gets it cashed, or gives it in payment for horses, carriages, wagons or other property, and then passes along to victimize another party. We hope the vagavond will get their deserts.

## ENDLESS RUBBER POLISHING BELT

The emery or other polishing material is applied to this belt in the usual way. By the use of this belt a perfectly pliant and true surface is presented to act upon the work, which is so desirable and hard to secure in the use of leather belts. When much worn, it can be placed in water to soak off he old coating without injury, and by simply wiping the belt Iability of the joints coming apart and without waiting for it to dry, as with leather belts. When compared in cost, efficiency, and durability with leather belts, the rubber polishing
 belt is found to be far superior. These polishing belts are al ways perfectly flexible, pliant, and free from unevenness of sur ace. After repeated coatings of polishing material have bee worn down and removed their unyielding property remain perfect, without perceptible change. By their use the work is better performed thanby the use of the leather belts. Patented March 26,1867 . All communications should be addressed to Jeremy W. Bhiss, No. 240 Main street, Hartford, Conn.

## GRISWOLD'S SUPPORT FOR WINDOW SASHES.

The engraving shows a very simple device for holding the upper sash of a window in any position desired for ventilat ing a room. Springs and catches are more or less liable to become deranged, and weights, without some fastening, are temptations to children. The arrangement is a series of bars of differing lengths, hinged one to the other, and the lower one hinged to the window sill. These bars are of such a length, width, and thickness that when extended they fill the pace in the window frame under the sash in which the sash slides. In the engraving the support is drawn out of the re cess to show it, but in use only one or more of the sections are

urned down, while the remainder are in an upright position When fully extended and in place, these bars are supports to the sash when closed, and when shut down on the sill the sash may be entirely lowered. One of these may be applied to each side of the window, each differing from the other in the lengths of the sections, thus giving a number of grade of hight to the sash. It is so cheaply and easily made and attached that where more elaborate and costly appliances ar not readily attainable it will commend itself to all.
It was patented by Mrs. Ellen M. Griswold, Hagerstown, Md,, January 22, 1867, who may be addressed for further in formation relative thereto.

## [For the Scientific American.] COST OF ELECTRIC LIGHT

The time appears to be near at hand when the electric light will be used for a variety of purposes. It is worth our while to inquire as to its cost. The expense and inconvenience at tendant upon the production of electricity upon a large scale has hitherto been an obstacle in the way of using the electri light, except for lecture rooms and a few other purposes. But the recent improvements in the construction of magneto electric machines and thermo-electric batteries have put it in our power to command the services of this beautiful illumin ating agent on any desirable scale of magnitude.
In order to examine the question of cost intelligently, let us refer both electrical and illuminating effects to the commo measure of power, viz., the foot-pound per minute. The ex periments of Mr. Julius Thomson, of Copenhagen. have showe
that the power to maintain the light to that of a standar candle for one minute is equal to the raising of a weight not exceeding thirteen pounds, one foot high in that time. I hav arrived at a similar result from a reduction of recorded experiments made by Müller, Ritchie, myself, and others. I am satisfied that, where an electric light of not less than eight hundred to one thousand candles is produced, under proper management, the power required will not greatly exceed 15 foot-pounds per minute per candle. For smaller amounts of light the power required will be greater.
Now let us inquire what amount of electricity is the equiva lent of, or is represented by 15 fout-pounds per minute. If 100 feet of No. 18 pure copper wire be coiled into a helix and immersed in a pound of water, and if the ends of this wire be connected to the poles of one cell of the Grove battery (pint cup size as used in telegraphing), the temperature of the water will begin to rise at the rate of $1^{\circ} \mathrm{F}$. in $9 \frac{1}{2}$ minutes, or $0 \cdot 105^{\circ}$ per minute. Now if the temperature of one pound of $0.105^{\circ}$ per minute. Now if the temperature of one pound of
water be raised one degree (Fah.) per minute, this effect will water be raised one degree ( F ah.) per minute, this effect will
be the thermal equivalent of 772 pounds raised one foot high in space per minute; the heating effect then, of our Grove in space per minute; the heating effect then, of our Grove
cell upon the water is the equivalent of $0.105 \times 772=81$ (call cell upon the water is the eq
it 80) foot-pounds per minute.
It is well known that a galvanic baltery will perform it maximum work when the external resistance which it en counters is equal to the internal resistance of the battery. have found the internal resistance of the pint cup Grove cell to lje equal, on the average, to that of 100 feet of pure coppe wire, No. 18 size. Hence the maximum external effect of the ordinary Grove cell may be set down as the equivalent of 80 foot-pounds per minute, equal to the production of $80 \div 15=5 \frac{1}{3}$ candle lights. I would not be understood as saying that this amount of light can be produced by a single Grove cell, but that 1,000 cells, if properly arranged, would be capable of volving somewhat more then 5,000 candle lights from a single lamp.
With sulphuric acid costing $2 \frac{1}{2}$ cents, nitric acid 10 cents zinc 8 cents, and mercury 50 cents per pound, the cost of run ning 1,000 Grove cells one hour, while doing their maximum work, would be $\$ 27.65$. This would give for 5,000 candles a cost of about $5 \frac{1}{2}$ mills per hour per candle.
The cost of gas light per candle per hour would be about one mill, if gas costs $\$ 3.25$ per thousand cubic feet, and if one cubic foot per hour gives the light of three candles.
With the Smee battery, carefully managed, the cost of 5,000 candle lights would be about the same as with gas.
Let us now look at the cost of electricity as developed by the magneto-electric machine. The power expended on the machine is consumed in friction, in heating the wires, mag nets, etc. On a well built machine which I examined in 1861 1,100 foot-pounds per minute were required to keep the ma cnine in motion when the circuit was open, and the machin doing no work. But when the circuit was closed 3,200 foot pounds per minute were required to maintain the same ve locity of rotation ; nearly all this excess of powier (viz., 2,100 foot-pounds) was measured as electricity, about two thirds (say 1,300 foot-pounds) being expended internally, heating the coils and magnets, etc., and the balance, 800 foot-pounds, measured as external useful effect. Had the external resist ance been larger, a greater proportion of the expended power would have appeared as useful effect. Suppose, however, that only 800 foot-pounds per minute could be utilized by this machine and used for illuminating purposes. This would be the equivalent of $800 \div 15=53.33$ candles, and the total power required (including friction, etc.) would be $3,200 \div 53 \cdot 33=60$ about sixty foot-pounds per minute per candle.
In the vicinity of Boston, power is furnished, per horse power, at the rate of $\$ 180$ per year of 313 days of 10 hours each, or at therate of $\$ 180$
only one fourth of this power could be utilized as light $\frac{33,000}{4 \times 15}=550$ candles would be the equivalent of one horsepower, and would cost $\$ 0.0575 \div 550=\$ 0 \cdot 0001046$, about one tenth of a mill per hour per candle, being about one tenth the cost of gas light.
Let us for a moment take another view of the matter. The average hourly consumption of coal by a good steam engine may le set down at four pounds per hour per horse-power, $=$ $(33,000 \times 60) \div 4=495,000$ foot-pounds from one pound of coal tilizing as electricity, and thence light, one fourth part of his, we get $495,000 \div 4=123,750$ foot-pounds, or as light $\frac{123,750}{5 \times}=13 \% \cdot 5$ hour candle lights from one pound of coal, through the agency of the steam engine and the magnetolectric machine.
With the thermo-electric battery I have been able to de velop 130,000 foot-pounds of electricity from one pound of coal $=\frac{130,000}{15 \times}$

There is still another point of view worthy our attention Common gas coal will yield about ten thousand cubic feet of gas per tun. This, at three hour candle lights per cubic foot would give $(3 \times 10,000) \div 2,000=15$ hour candle lights pe pound of coal. About twenty-five cubic feet of illuminat ng gas weigh one pound. Hence one pound of gas, after it is made from the coal, will yield a light equal to tha of a candle for seventy-five hours. One pound of pure carbon, wholly burned to carbonic acid gas, yields 14,500 units of heat, equal to $772 \times 14,500=11,200,000$, or $11 \frac{1}{5} \mathrm{mil}$ lions of foot-pounds of work: hence, were the total en ergy of one pound of pure carbon converted into light, it would be equivalent to one candle light for the time of
$\qquad$ $\frac{11,200,000}{15 \times 365 \times 24 \times 3}=15$ 5: ong yean exd five months.

To recapitulate: the gas made from one pound of coal would yield a candle light for fifteen hours; one pound of the gas would yield a light equal to one candle for seventy-five hours ; but could all the energy in a pound of carbon be converted into light, it would be equivalent to the burning of a candle for 12,410 hours.
Thus it will appear that by our ordinary methods of gas lighting we utilize much less than one per cent of the energy stored in the coal. I think we may reasonably expect that electricity, as developed by the thermo-electric battery, the magneto-electric machine, or some still more efficient apparatus, will help us in some way to bridge the chasm between fifteen and twelve thousand hour candle lights from a poun of coal.

Salem, Mass.

## Courespmathare

The Esitors are
resyonuleits.
ble for the opinions expressed by thetr con

## ' Wirbel-Bewegung."

Messrs. Editors:-Are you aware that smoke rings are frequently produced during the firing of light and heavy ordnance, from smooth bore as well as from rifle cannon, and from 3 -inch to 15 -inch calibers? Sometimes they proceed from the vent, but I think the more beautiful ones are from the muzzle. They appear of a double character, a ring within a ring, and always remind me of the rings of Saturn. During the firing of the 8-inch rifle in April last at this post, one stormy day I observed a double smoke ring unravel itself from the clouds of smoke. It gradually ascended, moving with considerable velocity against a head wind in line of fire, and con tinued to rotate distinctly for several minutes, expanding by degrees and throwing off a stream of smoke from the oute edge. The space within the inner ring on this as on all occasions was free of smoke. Meantime the general smoke of discharge was blown quickly to the rear and over the ramparts, being a very unexpected sight. I called the attention of the Captain of Ordnance and of others to the fact, that the smoke rings on occasions moved against a head wind.
Prof. Nichol, author of the "Architecture of the Heavens," puts forth the theory that the gaseous heavenly bodies may throw off rings while in the nebulous state, being a result of the combined actions of contractions and rotations. He thinks the rings may break up and form satellites. He says, "were the belt placed on a wheel and driven with gave tinue so doing were it not for the earth's gravitations; but it appears now evident that rings of nebulæ may be formed under other conditions.
T. T.

Fortress Monroe, May 13, 1867

## Russian Amer

For a distance of nearly 1,000 miles, says a writer in the New York limes, the whole coast is thickly studded with islands of all sorts and sizes. The inland waters formed by these islands are as calm and unruffled as a mill pond. In the summer season it is a paradise for those who have no other goal in view than to exist in a free, untrammeled at mosphere, skim tranquilly along the quiet waters in light canoes, and at night pitch their tents on the nearest island There is always plenty of game to be found. Besides water fowl of every description, the larger islands mostly abound with elk, deer, black bear and grouse.
The main land presents a series of inlets and arms of the sea, running far into the heart of the lofty coast range. There is scarcely an acre of decent farming land to be seen; in fact, we may travel a long distance and not discover a spot level enough to build a good sized house on.
The Stiken River is the fourth in volume and size on the west coast of North America, ranking after the Columbia, the Colorado and the Frazer. It empties itself by three channels into the Pacific, 70 miles below Sitka, and in about 57 degrees north latitude. It took us four and a half days to ascend 170 miles, while in descending the same distance the vessel made the journey in less than sixteen hours. For the first hundred miles or so, the river is walled in by huge mountains with peculiarly sharp volcanic cones or peaks, rising one above the other and covered with snow. The scenery is of the grandest and most stupendous nature, and our little steamer, staggering and trembling against the swift current of the river, seemed a very cockle shell in the presence of these vast and silent creations of the Almighty. The most extraordinary natural feature that attracted our attention was a glacier or field of blue ice, about 40 miles up, on the north bank of the river. It is about 150 feet high on the river, and extends along the edge of the stream for eight miles, running back into a valley among the mountains as far as we could see. A cañon was finally reached, which baffled all attempts to pass through or around it, although several bold miners lost their lives before their companions gave up the hopeless effort to navigate the canon in their canoes. A land journey of 100 miles failed to find any practicable approach to the river, which was left unexplored farther.

A Grindstone should not be exposed to the weather, as it not only injures the woodwork, but the sun's rays harden the stone so much as, in time, to render it useless. Neither should it stand in the water in which it runs, as the part remaining in water softens so much that it wears unequally, and this is a very common cause of grindstones becoming "out of true."

T'IE income of McCormick, the noted patentee of the reap ing machine, was last year, $\$ 169,760$

## LIFE-SAVING INVENTIONS.

The labors of the Commissioners are at last finished, the Board having adjourned on,Friday, May 24. It will necessatily be several weeks, however, before their voluminous report will be ready for publication. Below we give our readers a full list of all the inventions presented for exumination; kindly furnished us by the secretary of the board, Mr. W. A. Wuphy This, we may remark, is the only complete list yet published




Berent gimerican aud foreign gatents. Onder thts heading we shall publish weekly notes of some of the more promi.
nent home and foreign patents. Converting Rectilinesar Motion into Rotarr.-J. A. Ehle, Greenburgh,
Wis.-This invention consists in operating a balanced lever or working Wis.-This invention consists in operating a balanced lever or working,
beam with sliding carriages and hooks attached, upon polygons or triangles, so that the powershall be transmitted to a shaft in a continuous rotary mo-
tion.

Wasfing Machive.-G. . . Hughes, Centralia, Miss.-This inventio. con-
sists in constructing a washing machine somewhat upon the plan of the common pounding barrel, but still very unlike it and partly more efficient in its operation and appointment.
Adjustable Eccentric.--J. B. Strickland, Scranton, Pa.-This improve-
ment relates to the manner in which an eccentric is secured to the shaft or axle of the locomotive or other engine, and to the manner in which it may be changed to suit the lead of the engine valve.
Bedstead.-Isaac Pedrick, Bridgeton, N. J.-This invention has for its ob-
ject to turnish an improved bedstead so constructed and arranged ject to furnish an improved bedstead so constructed and arranged that the
weight upon the bed bottom may press againat the shoulders or ends of the weight upon the bed bottom may press against the shoulders or ends of the
sideand end rails; so that the posts may be detached without taking the sideand end rails; so that the posts may be detached without taking the
bed bottom apart; and that the slatsmay be easily turned over for dusting. Carch for Door Locrs.-G. W. DaCunha. New York City.-This inven-
tion consists in an improved catch or nosing for door locks formed with a flange to project along the jamb,and with a flange to project along the casin the whole being cast solid in one piece
Animal Trap.-J. W. Hollingsworth, Salem, Ind.-This invention has for
its object to improve the construction of the animal trap patented by the its object to improve the construction of the a
same inventor and numbered 58,826 , Oct. 16,1866 .
Car Coutling.-W. A. Stowell, Moretown, Vt.-This invention has for its object to furnish an improved car coupling, simple in construction and ef
fective in operation, which shall be self coupling and which may be un fective in operation, which shall be self
coupled without passing between the cars.
Gats.-Jacob Vail, Beloit, Wis.-This invention has for its object to tur-
nish an improved gate strong, simple and durable, and which may be opened nish an impro ved gate strong, simple and durable, and whic
and closed by the driver without getting out of the vehicle.
Disinfecting Seat for Privies, etc.-Neil Cliford, A.N. Bell, Brooky N. Y.--This invention consists in so combining with the seat of a privy, or other similar place, a receptacle for deodorizing or disinfecting, and in so connecting it with the said seat, that when such seat is used said deodorizing
or disenfecting material will be thereby discharged into the vault below the seat.
Sroves.-A. Lee, St. Paul, Min.-This invention consists in an arrangement whereby the radiating surface of the stove is greatly increased, and fuel is economized.
Cullender Boiler.-B. F. Porter, Manchester, N. H.-My invention con-
gists in combining with the common culinary boiler, the essential feature sists in combining with the common culinary boiler, the essential feature :or the cullender orstrainer, and also in dividing the space in the boiler by par
titions which are removable at pleasure and also in providing means by titions which are removable at pleasure and also in
which the cullender boiler may be used as a steamer.
Rakes.-J. M. Long, Hamilton, Ohio.-This invention has for its object to
furnish an improved Iake so constructed and arranged that the weight of the driver may cause the rake to act promptly when unloading, and so that when the rake teeth revolve up to unload, the shafts and the fingers may go
down disengaging the rake teeth from the collected lay in much less time than can be done with other rakes.
Safety Lamp.--H. Weston, Towanda, Pa.--This invention has for its ebSAFETY LAMP.--H. Weston, Towanda, Pa.--This invention has for its ob-
ject the obviating of accidents which now occur in using lamps provided with kerosene, or other similiar volatile eydroc-carbons as a burring ma-
terial. As the burning material is consumed the gradually enlarging space above it in the lamp becomes occupied by vapor or gas which is highly explostve, and which, if a loose wick be used in the burner, is very liable to be
ignited by the flame, especially in blowing out the flame, which is reequently ignited by the flame, especially in blowing out the flame, which is frequently
done after using the lamp, the wind driving the flame down around the loose wick into the body of the lamp. My invention has further for itsobject the prevention of the leakage of the burning material from the burner, which
now occurs in a greateror less degree in using the ordinary lamps, and which runs down the sides of the same, soiling the hands when the lamps are
grasped.
Stripping the leaves from Sorghum or Sugar Cane.-James a. Campbell, Kent, Ohio.-This invention relates to a new and improved machine fo
stripping leaves from sorghum and other sugar cane and also for depriving the stalks of their tops so that the cane will be fully prepared for the rolling or crushing mill.
Machine for Raking, and Pitching or Loading Hay and Grain.-Leo pold De Laceé, Springfield, Ill.-Th is invention relates to a new and tmproved machine for raking and pitching hay and grain from the field as left by the
mowing or reaping machine, and depositing the hay or grain upon wagons or earts, thereby enabling the farmer, with the aid of one or two men, to safely harvest and putunder cover in a given time as mush hay or grain as can be cut by two machines.
Method of Preparing and Packing Oil.-P. G. Finn, Erie, Pa.-This in-
vention relates to a new and improved method of pieparing and packing vention relates to a new and improved method of pi eparing and packing
coal oil tor transportation and storage. Y Beehive.-B. S. Haviland and E. H. Haviland, Fort Dodge, Iowa.-This in vention relates to a new and improved beehive of that class in which a
plurality of colonies are kept, within a single box or house. The object of plurality of colonies are kept, within a single box or house. The object of
the invention is to afford a circulation of air through the several hives in the box or house so that the animal heat from all the bees will circulate freely through it. and in case of a weak colony being in the box or house it will re-
ckive a requisite amount of warmth from the others. The invention has also ckive a requisite amount of warmth from the others. The invention has also
for its obiect the isolating of a hive from the others when necessary, in order that an empty live may be cut off, so that those containing colon,ess may re-
ceive all the benefit ot the animal heat, the circulation of the latter being eonfllied to the inhabited hives.
Device for Elevating Ice.- Henry Litile, Middletown, N. Y.--This in vention relates to a new and improved contrivance for elevating ice from the
river, pond or lake where it is cut, into the ice house contiguous thereto.

Gox for holding Powder or Pulverulent: Substances.-George A Moss, New York City.-This invention relates to a new and improved box
for holding powder oulverulent substances and is designed for putting up for sale those powders which are used, or applied for use, by sprinkling them
from a perforated cover, such, tor instance, as blue or indigo powder used in
the laundry tor clothes, the box in which the powder is put up and sold the laundry for clothes, the box in which the powder is put up and sol answering
der from.
portable Seat.-James F. Campbell and Cornelius Tinney, Williams drivers on street cars, and it is of such a construction that it can be readily applied and detached, and when applied adjusted to any position desired.
Hog Ho-DER.-W. and C, Leffingwell, Clarksburgh. Ohio.-This invention
relates to an improved hog holder for ringing, wiring or snouting, or for slaughtering hogs, and consists of an adjustable box capable of admitting on hog at a time, and of being adjusted to the size of the hog so that he cannot
turn, and of holding his head fast in the position required, whereby the dangers and difficulties attendant or the present mode of handling hogs for the above purposes as well as the injurious effects thereof upon the hogs, are en tirely obviated.
Car Coviling.-W. H. Mays, Hillsburgh, Nova Scoiia.-This invention re termed self-acting or self-coupling, and it consists of a draw hook attached on one draw head and a projeetion or ledge attached to the other draw head for the hook to catch over; the above parts being used in connection with
a releasing or disengaging mechanism, whereby the coupling of two cars, of the same, when necessary, effected.
Line Kiliv.-George Atkins, Sharon, Pa. - This invention relates to an im he bosh of the kiln in the shape ot a truncated cone, based on an inverte cone, similar in its general conformation to that of a blast furnace, and pro
vided with two tiers of furnaces which extend into the body of the kiln an vided with two tiers of furnaces which extend into the body of the kiln and
open divectly into the chamber, to throw the heat uniformly throughout the open diwectly into the chamber, to throw the heat uniformly through
mass of limestone combined therein, and thus burn the lime better.

Equating Solar Chonometer.-L. Miffin, Germantown, Pa.-The objec the equating solar cironometer embraced in this invention is to exhibit the mean or clock time of day in lieu of the solar time.

Pruning Shears.-Peter Keck, Zanesville, Ohio.-The nature of this invention consists of a combination of three levers to form a pruning shears
whereof the cutting blade has a convex edge, the levers, being so attached as to produce a drawing cut, and has for its objects increased facility in the use сомp the pruning shears, and the prod
Compression Cock.-Charles M. Alburger, Philadelphia.Pa.-This invention relates to an improvement in compression cocks or faucets and consists
in raising the valveseat by forming it with a flange or bead around the edge to receive upon it a washer made of block tin or other suitable substance and steam tight
Gas Apparatus.-B. L. Fetherolf, Tamaqua, Pa.-This apparatus is de-
signed for generating illuminating gas trom petroleum for family use, by ap plying a gas generator to an ordinary cook or heating stove, like a water back or fire brick lining, and thus by means of the fuel used for domestic pur poses supplying th house with light as well as heat, and making a saving. Gang Plow.-James W. Sursa, San Leandro, Cal.-This invention relates vice tor raising and lowering the plows whereby they may be set at any required depth for working, or elevated above the ground to clear it entirely when the plow is moved from place to place.
Envelope.-Ralph S. Jennings, New York City.-This invention relates oo improvements in the construction of flat envelopes which are more par ticularly designed to be used for tra
ments safely by express and the mails.
Carriage.--Francis Baker, New York City.--This invention relates to that
class of carriages having er parts for supporting the shas in a therein.
hay and Cotton Parss.-J. G. Roux, Raymond, Miss.-The novelty of this invention consists in two horizontal screws, located in a frame and connected to yielding levers, which are attached to the follower of the press in
such a fmanner as to act powerfully on the said follower. These levers are acted upon by the.screws in such a manner that when the greatest pressure is tage and exert the most power.
Teaskling Attachment to Gig Mills.-Ernst Gessner, Aue, Saxony.This invention relates to an attachment to gig mills, which is composed of a
series of revolving disks covered with cards or other suitable material which act in conjunction disks covered with cards or other suitable material, which revolving motion of the disks and their position in relation to each other, the fiber of the cloth is acted on throughout the whole width of said cloth and ously on the surface of the cloth, thus raising the nap perfectly in a comparatively short time.
Bottle Stopper.-Horace S. Carley, Cambridgeport, Mass.-This inven ner that it cons securing the stopper to the neck or the bot out ofline with the same without detaching it.
Grind Sroxe.-Warren P. Miller, New York City.-This invention relates to a grind stone which is composed of a number of blocks of grinding ma a manner that they form a ring of grinding material, the face and not the periphery of which is to be used for grinding saws and other metal articles Horse shoe Machine - John W. Kingsbury, New Bedford, Mass.-This in vention relates to a machine for forming horse shoes from cold bar iron, the
mathine betng so arranged as to be adjustable for all sizes of horse shoes, and machine betng so arranged as to be adjustable for all sizes of horse shoes, and
so that one shoe is formed during each revolution of the horizontal and drivso that one shoe is form
ing shaft of the machine
Device for Holding Cigars.-Charles Appel, Hoboken, N. J.-The ob
 into the pocket without injury to the cigar and without burning the pocket The device will be of great value to smokers when entering ears or ladies
rooms, or other places where smoking is prohibited; they can then put the burning cigar into my improved holder where it will be ext inguished, and carning eigar into my improved hold
Temporary Rudder.-H. L. Stibbs, Savannah, Ga.This invention has for its object to furt ish an improved temporary radder, so constructed and ar ily and quickly adjusted in place.
Car Cotplisg.--J. Smith and J. F. Irvin. La Porte, Ind.-This invention
consists in providing for drawing the pin from the coupling link wen the consists in providing for drawing the pin from the coupling link, when the
cars are to be uncoupled, by a slide which has a cogged rack attached to it, and in a pinion on a horizontal shaft which works in the rack.
SEED:Sower.-Elijah U. Scoville, Manlius, N. Y.-This invention relates to sown, and which can be adjusted tor sowing any desired quantity at once, so that the seed can be spread tbicker or tbinner as may be desired. The inven-
tion consists chiefly in the use of a revolving roller, which is arranged longition consists chiefly in the use of a revolving roller, which is arranged longi-
tudinally below the seed box. For the circumference of this roller are ar ranged longitudinal grooves, which receive the seed from the hoppers in the
seed box, and distribute it upon or against a revolving, zig-zag, wire seive spreader, by which the seed is struck and spread evenly over the surface the soil.
AdJustable Self-sharpening Plow Points.-Mr. H. G. Hall, of Putnam,
Ohio, has just patented a new and valuable point for plowshares, which ca be removed and replaced at pleasure. The point is of chilled iron, cast on shank of wrought iron, which fits into a dove-tailed recess cored in the share It can be reversed, so that when worn on one sidc the other side may be pre
sented for service. His in vention comprehends also adjustable edges, to be chianged at will. The device seems to add creatly to the durability of a plow while it does not materially increase its cost.
Card Holder.-H. H. Pember, New York city.-This card-holder is in Sewing-Machines.-Robert Barclay, Buffalo, N. Y.-This invention re lates to a sewing-machine, the presser foot of which receives an oscillating motion simultaneously with the feed wheel in such a manner that a rectilin-
ear even and sare feed is obtained. The oscillating motion of the presser oot is effected by a cam which aets on a spring dog which connects whe the the feed motion of the presser foot can be regulated to correspond to the
motion of the feed wheel. Said cam is mounted on the end of the shaft which sith to produce the motion of the needle slide, and it acts in conjunctio with an additional cam, which serves to impart a rising and falling motion
to the take up mechanism, the ohject of which is to take up the slack of the on the top of the material to be sewed.
Horse Har Fork.-H. H. Hatheway, Clockville, N. Y.-The object of this invention is to so construct and arrange a hay fork that it wiil operate easily, ther obstructions.

Seed Planter.-D. H. Hull, Plantsville, Conn.-This invention relates to
seed planter which can be used for planting corn, cotton and other kinds eeds, and wich in aerand that out of the ground with ease and facility, and that the samecan be let int

Sugar Cane stripper.-S. Terry Hudson, Success, n. T.-This invention relates to a device for stripping off the leaves of sugar cane, and consists in which may be stuck upright in the ground in the field anywhere convenien to the cane, and shifted aboat as the leaves accumulate in stripping, so as to save handling them.
Mandracture of Iron and Stere.-Lorenzo sibert, Mount Eolon, Va.produced in an ordinary blast farnace for the manufacture of iron and stee of superior quality

## Ausurxs to Courrsumatents.



P. T. L., says if you rub your finger on the outside of a glass lamp from the surf
rise on the inside.
W. N. B., of Iowa.-The barrels of double barreled guns are so set that the shot from both barrels may strike the same spot. Theey are
slightly inclined to each other toward the muzzle, and the lines of direc Hon ate intended to meet at the ordinary distance of fring. Shot gun bar rels should be more inclined than rifie barrels.
G. W. M., of Pa.-Concrete is a mixture of mortar with Coarse materials like gravel and fragments of brick and stone. When the concrete is to be exposed to water.hydraulic cement inoula be esed
of lime. Lime mortar may be mixed with cement in any proportion, but the hydraulic property of the concrete is is lessened by the increased proportion of lime. Whether a concrete or stone wall should be used for a the work is to be done. A concrete wall is not so durable as a wall of hewn
R. F. W., of N. Y.-The spectacle lens you send is a genuine pebble i.e.,., tit was cut from a crystal of quartz. Such lenses are often de.
signated by the locality from which the quartz was obtained as Brazilian, signated by the locality from Which the quartz was outained as srazilian
Scotch, Madagasar, etc. A genuine pebble lens will readily scrateh win. J. d. H . W., of Mass.-The water and steam in a boiler when the itre space does not reach above the surface of the water are at the same
P. D., of C. W.-The publication of your article on the HarL. T. R., of Conna., suggests that some ingenious inventor "fix up" a whistle to be operated by the wheels of the velicle used by milk A. J. W.; of N. Y., wonders that some genius does not invent a small hand blower to supersede the common bellows for tamily yse. One
operated by clock work, cheap and efficient, he thinks would sell like hot N. D. H. H., of Pa.-The ordinary method of getting rubber into the form ot sheets is to orind it up in a machine called a masticator
In this process the rubber is softened and made more plasti. In this con dition it is passed between powerful rollers or callenders, from which it comes in a continuous sheet. Another plan is to spread a thick solution of rubber on a level surface, and allow tiee solvent to evaporate. Coal tar
naphtha and light petroleum oil are suitable solvents. The rubber used in naphtha and light petroleum oil are suitable
these processes must be raw or unvulcanized.
D. W. P., of Pa.-A good way to purify the mercury of your steam gages, which you say has become foul, is to wash it in a strong solu-
tion of sal soda, and then filter it through a cornet of paper, that is paper rolled up so as to make a narrow conical cup which shall have a very small
opening at the bottom for the mercury to passs out. The mercury should be filtered se everal time untint is conpletely dry
R. L., of Pa. - The specimen you send is specular iron ore When pure it contains $69 \%$ per cent of metal. Your sample is slightly m. K., of Pa.-Fermentation of beer, and consequently the generation of carbonic acid, may be checked by cooling to near the freez.
ing point. But the cooling will not destroy or decompose the carbonic ng point. But the cooling will not destroy
acid aiready formed, as you appear to suppose
G. A. H., of Pa.-The Ruhmkorff apparatus is simply the ordinary induction coil which is used for medical purposes, on a large
scale. is required to secure insulation. The primary wire is only a few yard
find in length and is wound on a pasteboard tube. The primary helix is in closed in a glass tube and upon the glass tobe the secondary wire is wound
The secondary wire should be one or more mies
min length; fitty miles of with silk shenlac. For experimental purposeses the secondany wire in sometimes di
vided and wound in separate helicees, so that a part or the whole may be
P. J. R., of Ohio, is not satisfied with what has been sai on the question " Why ice is slippery"" and propounds the theory that ice is
composed of smooth zlobular particles which are easily detached, and thai composed of smooth globular particles whices
a body sliding on ice rolls on these particles
G. W. B., of N. Y., believes that the influence of the moon on the growth of plants is generally recognized, and has been informed that a
man has retored his hair, which had become quite thin, by having it cut immediately after each new moon
A M. D., of Mass,, has a machine which has become so thoroughly charged with cecectricity that its operator is aficceted badly by
it. Near the driving pulley is a 10 inch belt which travels 1,300 feet per minute and froin which the elecetricity comes. The electricity may be taken of from the belt before it reaches the machine by arranging near it a series ond
ground.
E. S. G., of N. J. $-\Lambda$ gas meter measures the gas by bulk only, and therefore when the pressure is much varied it does not registe.
correctly. At thigh pressures the meter underestimates, ... We have not heard of any water wheel which establishes a new pinciple in pneu matics. mica from the mountains at little expense, but it is not able to say that it is of commercial good quality. He should send a fair sample of it to some
E. W., of Pa., is a miller and desires to learn how to rid him self of the first known as the pest known as the bolt eater. It is a black
bug abol bug about half an inch long
whichis worth fifty dollars.
E. G. G., of N. Y.-There are many patents concerning mix tures of tar with gravel, sand, tragments of stone, etc., to be used for gar
denand other walks. It is not proper for us in this place to give a cata den and other walks. It is not proper for us in this place to give a cat.
logue of the patents or to discriminate between their respective merits. N. P., of Phila.-One of the best articles for destroying cockroaches are red wafers-scatter a few about the places where they mos
a.ppear and they will eat them with a relish and soon die. The Persian in sect powder is also a good article for the purpose but phosphorus paste is better than the latter.

## Eusimess and exromat.

## The charge for insertion under this tead is 5 ocernss a une.

Parties having a deposit of "mica" can sell by addressing W. W. B., 28 Holliday street, Baltimore, Md.
Flax Mill Wanted at Coloma, Ill. See advertisement and address A. P: Smith, Sterling, Ill.
Molders' Tools, Surface Gages, etc. (Manufacturers of), send price list to " Traveler,' Box 143, Grand Rapids, Mich.

The Great $\boldsymbol{m}$ ormon Tabernacle at Salt Lake. Our engraving presents the commencement of the structure, which has since progressed so far towards completion covered in. By it a correct idea may be had of the enor mous size of the building, and the mechanical difficulties attending the construction of so ponderous a roof. The credit farrying on such a vast work can best be appreciated whe f carrying on such a vast work can best be appreciated whe it is borne in mind that the timber is brought from a consid
This building was not constructed with any view to display architecture, but merely as a temporary meeting place
plain ratber than a grotesque style of architecture, it will reference to the engraving it will be readily understood. The rom its vast proportions and striking originality of design, engraving shows only the lower part of a stand box, as the make a marked impression upon every beholder, and will cover does not materially differ from those in ordinary use, exstand a monument of magnificent zeal and unparalleled unity of purpose and labor on the part of the Mormon people.

Sweet's Matrix-Printing Machine
The principle of this ingenious American invention, which excites so much interest at the Paris Exposition--having even been elaborately described and illustrated in the En gineer-is the arrangement of a complete alphabet of steel gineer-is the arrangement of a complete alphabet of steel
cover does not materially differ from those in ordinary use, ex cept in a particular hereafter to be mentioned. Hanger boxes can be made with the peculiar devices shown in the engrav ing as well as stand boxes.
A is a reservoir for the oil, cast in the box, having an in cline toward one side on which rests a flat slotted spring, B, which supports the pivots of the disk wheel, C , the body of which projects through the slot so that its surface turns in the oil. As the shaft revolves the wheel turns by its sligh pressure upon the shaft, shown by the dotted lines, and brings


THE GREAT MORMON TABERNACLE AT SALT LAKE.
for the people to assemble, and to take the place of the old |bringing any type at pleasure, by the revolution of the wheel, or thernacle and Bowery, the former of which was a larg building, and the latter simply a huge shed covered with green boughs. Inside of the Tabernacle an organ is now constructing, second in size to none in the United States except the celebrated one ir Boston.
Our readers must not confound this edifice with the great Mormon Temple, which is a far more elaborate structure, of cut granite, erecting not far from the Tabernacle, and more slowly progressing. The granite is brought from a distanc of about ten miles, and the blocks are so large in size, and the quantity so great, that a canalis being built to the neigh borhood of the quarry for transportation of the material.
The Tabernacle is in the form of an ellipse, with an extreme length of 250 feet, and width of 150 ; extreme hight of root 78 feet; hight of ceiling 68 feet. The immense roof frame ests upon 44 cut stone piers, about 12 feet apart and 20 feet in hight, which gives 48 feet of spring to the arch. The 44 bents, or principal rafters forming the arch are composed or thicknesses of $2 \frac{1}{2}$ inch plank, framed like lattice work strongly pinned and bolted, and tied together by 15 hori zontal cross timbers on the outside, upon which the smaller rafters for the sheeting will be laid, and 15 similar cross timbers inside, to which the ceiling joists will be stayed. The 13 half bents, resting upon the 13 piers, in curve, at each end, join diagonally upon the apex of the arch of the two outside parallel bents.
The stand will be in the west end; the floor to be laid level for a distance of 60 or 70 feet in front of the stand, thence gradually raising to the east end, where the seats will be evel. It is estimated that the house will seat about 10,000 persons.
But, large as is the extent provided for the accommodatio of the people in the above building, it is now feared that it will be too small and that further accommodations will be necessary. For freedom of egress, a v.ery material consideration where large audiences are concerned, ample provision has been made in the folding door appointments of the entire space between the 9 piers in line on either side
A cornice, 8 feet deep, will ornament the stone work. In the majestic, towering, self-supporting roof of this building, there will be consumed nearly $1,000,000$ feet of lumber. When finished it will present the appearance of a ponderous half globe, with siden slightly compressed, and although of
anto vertical position under the center, and there pressing downward to the precise and uniform depth chosen for the matrix. The impression is made upon soft thick paper prepared for casting upon, which is fed forward by mechanism, the precise breadth of each letter brought into play. The transition from the end of one line to the beginning of the next is provided for in a similar way. The process is subject to the inconvenience of a calculation to be made beforehand upon every letter and word of the copy, to see just what paces must be introduced between the words in order to fill each line with precision, since the line cannot be "jus tified " if unequal, after being imprinted,

## MORRIS' SELF-OILING BOX

The box seen in the engraving was patented through the Scientific American Patent Agency, Jan. 1, 1867. It is a de

ice for lubricating the journals of shafting, by means of eservoir in the body of a box and on arrangement of parts onstruction and the oil to the shaft. It is not expensive in
the oil to the surface of the shaft. Any superabundance of the oil is deposited in the longitudinal channels in the face of the box, which communicate with end channels conform ing to the contour of the box. From these end receptacle passages lead under the lining to the central reservoir. The direction they take is shown by the arrows, and their apper tures are seen at one end and in the center. The cover ha end passages or channels corresponding with those in the box and an oil hole over the outer portion of the rim of the roll er, C.
It will be seen that a continual circulation of the oil is kept up and that no oil can escape from the box to be wasted With this device drippers to hangers are unnecessary and he journals will run for months without being oiled
Further informatiou relative to this box can be obtained of he patentee, Geo. M. Morris, Cohoes, N. Y.

## Ericsson and the British Navy.

An English journal which champions the cherished broad side system of the British navy, having attempted to weaken heinfluence of Bourne in favor of the monitor system by in muating that he was an agent for Capt. Ericsson, Mr. Bourne as published certain correspondence showing that Ericsson this solicitation had consented a year or two ago, to giv the Admiralty any advice that might be desired in the construction of turret ships. Having failed however, to induce the Admiralty to act in this direction, the matter dropped. The following is the concluding portion of Mr. Bourne's last etter to the Secretary on the subject :-
"In now notifving to you Captain Ericsson's acquiescence in this decision
may be permitteat to expressmy regret that their lordships have not bee ips have not bee ne of the most remarkable men of the present age, and his assent to m. hought it a mat mer of some impor tane e to have obtain ed, especially as h
has willing to act without emolum ent or conditions, bot h his reputation an his weilth rendering him independent of such considerations.
"London, May 30, 1866.
The Hammond Rifle-A new American breech-loadereceives very high encomiums in England. The British Gov ernment, which has adopted the Snider conversion for the Enfields; pending a mature and final selection, have ordered competitive trial of all patterns, and the Mechanics' Magazin e formidable Hammond rifle and the Daw cartridge sion already have before them

GCymymury
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o. D. MUNN, s. h. Wales. A. e. beach.

## r-mamex 


VOL. XVI., No. 23.... [New Series.] . . . .Twoenty-first Year.
NEW YORK, SATURDAY, JUNE 8, 1867.


## ANOTHER NEW AND REMARKABLE TEXTILE

It will be pleasant indeed to find the enthusiastic anticipa tions of M. Benito Roezl, of the eminent French naturalists, Blume, Decaisne, and others, and of Mr. A. B. Bacon, chair man of the Section of Agriculture, New Orleans Academy of Science, realized in respect to the Ramie or Boehmeria tenacissima, of Java. From the nature of the case, anticipations so high must seem extravagant, and be held subject to extra haz ards of disappointment, until their actual accompltshment leaves no place for conjecture. From a communication by the last-named gentleman to the Academy of which he is a mem ber, we learn that at present the exotic is introduced and flourishing in a large plantation in Mexico, and that the conviction of the naturalists who have nursed it and experiment ed upon it for the last twenty-three years, that its fibre is stronger than hemp, as fine and white and twice as durable as linen, and more productive than cotton, is so far confirmed that in 1885 M . Roezl cxported and sold in England over 5000 lbs. of the staple at double the price of the best quality of cotton. Its beautiful fabrics will be displayed in the Paris Exposition, but we have as yet received no account of them.
The Ramié belongs, like the hemp and the nettle, to the urticaceer, and was transplanted from theisland of Java to the Paris Jardin des Plantes, by Blume, in 1844, where it was reared in the hot-house until its introduction into the more congenial climate of Mexico by M. Roezl, former head of the Horticultural Institute of Belgium, within cleven years past. It is considered that only the middle and southern portions of our Gulf States will afford it a suitable climate, and that in that latitude it will make three or four crops a year, each equal in quantity to the most prolific of hemp.
The perseverance of Mr. Roezl in domesticating the staple in the western world has been almost romantic-perhaps we
should say heroic-and richly deserves the high reward his should say heroic-and richly deserves the high reward his a year in familiarizing himself with the character and growth of the plant, he emigrated to Mexico with a store of its roots. On his way to the capital he was robbed of his treasure by the Mexican banditti, who took little benefit from their crime, and was obliged to write to his friends in Europe for a new supply, which was at length procured through the good off ces of the British navy : but this perished on the voyage to
England. Again it was attempted, and again the plants were killed. A third attempt succeeded, but the plants had to be placed under hot-house cultivation in England, to give them strength for another great voyage. At last, in 1859, after six years of waiting and endeavor of this kind, his piants arrived half dead, and with the skill of an accomplished and scientific horticulturist he nursed them successfully into life, and within two years found himself the owner of a thriving plantation
This was but raw material, and the least part of the diffi culties had been overcome. 'He imported from England the most approved machinery for cleaning flax and hemp, but it proved unsuited to the requirements of so fine a fibre. Two years of effort in this direction were spent in vain, when he fell back upon his own tireless resources, and in two years more produced two inplements of his own invention by which the stalks were converted within twenty-four hours
after cutting, into long skeins of pure, white and silk-like fiafter cutting, into long skeins of pure, white and silk-like fi-
ber, ready for spinning. In February last, Mr Roezl visited Cuba with specimens of the results of his eleven years labor which after careful examination were pronounced of the first importance by the naturalists and agriculturists of the island, who predict that it will supplant tobacco and coffee as a pref erable staple for Cuba. Mr. Roezl takes five crops per annum from his plantation, the matured plant, which is perennial, at taining when well rooted the hight of twenty feet.

## CONDITION OF THE PATENT OFFICE

Nearly two months ago, in announcing the passage by Con gress of a bill to increase the examining force of the Paten Office, we commented as follows:-"The Commissioner is now clothed with ample authority. We understand that he in tends to fill all new positions by promotions, which is certain ly very commendable. We earnestly hope that the Commis sioner will. act promptly and energetically in carrying th new measure into effect. The business of the office is suffer ing very much from the delay which attends the examination of cases, and now that the Commissioner has the power, w hope that he will
We have yet to learn that the Commissioner has made a single new appointment or taken any active measures to wards bringing up the back work of the Office. Hundreds of applications are awaiting action, some made six month and more ago. Inventors are getting discouraged, and every body who has business transactions with the Office is disap pointed that the Commissioner does not avail himself of the authority vested in him by Congress to increase his force. In some classes the examinations are closely up, but in others they are several months behind. This condition of things should not exist, and with the power ceded to the Commis sioner by our last Congress, there is no occasion for it. Wak up! Mr. Commissioner: inventors are busy, applications fo patents never were greater, the treasury of the Oflice is ple the most prosperous department under Government is a vig the most prosperous
orous administration.

## MODES OF WORKING WOOD

So much of the public attention has of late years been di rected to the new preparations and applications of the metals particularly iron and steel, that the merits of that old time friend of man civilized as well as savage, wood, are likely to be overlooked. Volume after volume is issued from the press, and our periodicals are filled with articles devoted to the properties, qualities, uses, and manipulations of the netals, while those which treat on wood are few and far between. Still, it would be difficult to imagine, in our present state of advancement, where to look for a substitute which should combine so many qualifications of usefulness and such adaptability to diverse manipulation.
Besides the hundred applications of cutting, splitting, and awing, wood can be worked in many more ways. It is doubtful if any substance with which we are acquainted is uceptible of so many radical changes-changes which alter
the very structure of the material and adapt it to the most opposite uses. It can be torn into fibrous shreds which make elastic cushions or beds; made into a spongy, porous mass hardened by chemicals which change its texture and make it semi-mineral in nature; compressed by mechanical means, closing its pores, until it is nearly as compact as the metals It may be molded into variousforms ; bent to keep its enforced position; dissolved into pulp and made into paper ; separated into lamince by percussion, and, in short, treated in any con ceivable manner except melted and cast.
Perhaps one of the most interesting of the methods of working wood is that of separating one layer from another by percussion, or by compression joined to bending. Thos woods only can be treated in this way which grow by exter nal concentric accretions, as many of our hard wood trees.
The wood for this treatment should be tough, elastic, and The wood for this treatment should be tough, elastic, and
straight-grained. The Indians of this country, and the basket makers in others, separate the layers of the wood by beating upon the
surface of a log with heavy mallets, when the wood comes off in thin lamince. This method of disintegrating wood is one of the oldest of human arts; probably no mode of working wood is older. What was formerly done by hand is now, however, performed by machinery. We saw the other day, in Jersey City, machinery which performed this work in a re markably rapid and effective manner. It was run by the Wilder Hoop Machine Company, and was designed for making (rolling) hoops of wood from a " bolt" split from a log. The wood used was black ash, although any tough, straight grained wood would answer. The bolt was a longitudina ceft the cross section of which might approach either a par allelogram or a triaigle. One end was presented to a space
between two swiftly-revolving heads armed with cutters between two swiftly-revolving heads armed with cutter
which almost instantly formed a wedge-shaped point, then to another disk with thin cutters which splits the V-shaped en at intervals corresponding with the thickness of the hoops to be made. These splits do not extend more than one or two inches from the end. The bolt is then run between circula saws and trimmed to nearly a square form, or to a parallelo gram,
hoops.
Then the bolt is passed between upright corrugated feed rollers held in contact by powerful springs. Directly behind hese were a set of smooth rollers, placed horizontally, be ween which the bolt passed, being compressed powerfully and by means of a curved guide compelled to take a shor curve. The result was a splitting from end to end of the bolt forming perfect hoops, or rather slips of equal thickness throughout. The philosophy was not difficult to understand The slits cut in the end of the bolt were starters for the thick ness of the splits. The wood, being wet, yielded to the com pression of the rollers, and the direction given the bolt by the curved shoe compelled one piece to slide upon anothe The whole process is a very brief one, occupying no more time probably than would be spent in reading this description. It is very interesting and gives the observant man new ideas
concerning the capabilities of wood. That its fibers can be cleanly separated, simply by compression and bending, to make as smooth a job as if sawed, and preserve the longitu dinal grain and consequent strength as perfectly as if split by ordinary means, is at least surprising.

## the gulf stream and the cuba telegraph.

A special survey has been made under the direction of the Acting Superintendent of the U.S. Coast Survey, Mr. J. E Hilgard, at the instance of the International Ocean Telegraph Company, with a view to determine the conditions to be en countered in locating the cable between Florida and Cuba hrough the Gulf Stream. The examination reveals a ver rregular and precipitous descent from the Cuban coast, reach ing the maximum depth of the channel, 843 fathoms (sa 5,000 feet) 37 miles from the Moro. From the northward, th bottom falls away in terraces without abrupt slopes. It is in the deep canons or gorges of the southern portion that the Gulf Stream and its counter currents find their channels while the sea lies almost motionless above the terraces of th orthern coast. About 21 miles from the coast of Cuba, submarine mountain rises in the midst of the southern chan nel, with the extreme depths of 748 and 843 fathoms on eithe side of it. The summit of this mountain is 2,400 feet above the bed of the straits and reaches to within 2,400 feet of the surface ; the current running over it so strongly that sound ings were made with great difficulty. It appears to be triangular in its general form, with precipitous sides, presenttriangular in its general form, with precipitous sid
ing at its west angle a bold prow to the stream.
Assistant Henry Mitchell, from whom the
Assistant Henry Mitchell, from whom these data are erived, states that the observations indicate the depth of th Gulf Stream to be scarcely more than one-third the maximum depth of the channel. He concludes that the Gulf Stream is not a profound movement, but an overflow of water from the Gulf, having for its office the restoration of surface level, while the office of the counter stream, or "polar current," beneath, is the restoration of equilibrium thus disturbed be ween waters of different specific weights or densities. This view of compensating currents is illustrated by observations in the Hudson river. In the dry season (July) the surface outflow of the river through the Narrows has been found to ccupy three-fourths instead of half the twelve tidal hours while in the under stratum the case is more than reversed nd the inflow predominates to such an extent that as eneral thing it is constant along the bottom, although not in elocity; and the same conditions with variable proportions btain for some distance up the river. On running a line of levels from New York to Albany, it was found that the bed of the Hudson river lies below the mean level of the sea fo over a hundred miles, while the surface of the fresh water or river proper, in the dry season, is above this level, yet not so much above as to counterbalance the excess of specific ravity in the sea water, which consequently during the ummer months flows in along the bed of the stream, while the fresh water overflows into the ocean. In other words, the Hudson, for one hundred miles, is in the summer but an arm of the sea analogous to the Gulf of Mexico, deriving much f its elevation as a stream, from a like cause with that of he Gulf stream, viz : its lightness, lifted above the sea level by the bottom pressure and inflow of the heavy sea water in the pposite direction.
The striking variations in the velocities of the Gulf Stream which were particularly remarked by navigators during the late survey, the weather being exceedingly calm, are ac counted for on the hypothesis that they follow the change in mean sea level which depend upon the declinations of the un and moon-more especially the latter. Prof. Bache ha shown that the mean level at Key West is one foot highe when the moon is in the equator than when she is at he greatest declination; while, on the contrary, in the North Atlantic the mean level is about three inches higher at he maximum declination: giving a variation of fifteen inches in tvel to account for the variations in the velocity of the tream.

## THE PEICE AND PROSPECT OF BREAD.

We have remarked the extraordinary phenomenon of bread tuffs going from east to west instead of west to east, and eve rom Europe to America in a few exceptional instances. The fact is that there is more flour and wheat at the east than a he west, and although the stocks on hand in New York are much larger than last year at this time, while large shipments are made from California, those in the west are much more than proportionally smaller, and prices equally high; so that he aggregate of breadstuffs in the country is evidently re duced enough to fully account for the present enormous prices Among the causes of scarcity are the short western crops of ast year (resulting partly from a scarcity of labor which th ar has left as a melancholy memorial of its carnage) the hal extinct agriculture of the South, and its heavy drain upon he northern markets. The anticipated crops, rich as thei romise is, cannot therefore exert their natural effect upon prices, and will not begin to replenish the marketat all unde wo months. But before that time, if no new calamity or por tent intervenes, the coming harvests will cast their shadow before, and discourage the extortion of speculators materially When they are fairly in the field, it may be rationally hoped he prices of food will come down to a more reasonable scale than has been known for years. The most cheering accounts of the wheat prospect pour in from every section of the country. The South has devoted an unprecedented proportion of land to food, and the crops promise unusually well, while in the West, the mighty tide of immigrating labor has filled up the ghastly chasm left by the war, the high prices have
produced a great increase in the breadth of land sown,-in some regions nearly double-and Providence has smiled upon the buriel seed and the tender blade. The deep snows of the winter have protected the wheat, and from every section comes the report that it is growing magnificently and promises a grlorious yield, far surpassing in the aggregate any crop ever before raised in thiscountry. The Puritans of New England, taught by hunger to feel their dependence on the God of nature, used to fast and pray one day in every spring, for a blessing on their hard fields, and their descendants keep up at least the form in the New England states to this day. Our crops lave yet to run the gauntlet of many foes, and may the Providence whose bounty we have seen so marvellously enarged in modern years, still regard mercifully the wants of our toiling millions, and "God save the wheat!"
The report of the Agricultural Department for April says: " Never has there been so general an expression of encouragement in view of the fine condition of winter wheat since the establishment of the present system for the collection of crop statistics. In more than nine tenths of the returns received, the condition of the crop is reported favorable and promising. From the South the returns are as cheering as from the West. The report states, however, that the loss of cattle from starvation and exposure the past winter has been extraordinary. Beef is not likely to be any cheaper.

## gleanings from the polytechnic association.

Dr. Feuchtwanger showed a specimen of tellurium, an e ceedingly rare substance commonly classed among the met als but which has much analogy in its properties to sulphur and selenium. 'The French call this substance one of the enctalloids. In its native state the ore is found combined with iron, gold, or silver. Its color is silvery white and brilliaut, and in appearance it closely resembles antimony. It is found in the Altai mountains and in Transylvania. Th specimen shown was found in a gold mine of California.
Mr. Fisher exhibited drawings for a steam-plowing machine or more properly a pulverizer. The machine resembles a locomotive with a short boiler, and mounted on wide tired wheels. The power is applied to drive a drum having circular saws thereon set three inches apart. By suitable gearing the engine advances slowly while the drums rotate with great rapidity, pulverizing the soil to the proper depth. The subect of steam plowing being thus introduced, its importance was acknowledged by all, but an animated discussion sprung up respecting the relative advantages of employing traction engines working the plows directly, or stationary engines working the plows by means of chains, as is the common custom in England. Both methods had their advocates who warmly argued their respective merits. It was claimed on one side that the traction engine beats down the field in ront of the spaders which it afterward is made to plow up as the wheels must be made wide enough to prevent the machine from sinking into the ground.
Mr. Parmelee read a paper on gypsum, describing its naure, and referring more especially to its use as a fertilizer Its value in this respect he asserted was owing to its absorp tive power in taking in ammonia from the atmosphere and storing it up to be disseminated by the rains through the
fields.
President Tillman gave the club the results of some exper $\mathrm{r}_{5}$ mentis he had witnessed at the works of the lead encased block tin pipe company, showing that this pipe possessed the same strength as that of lead pipe of twice its weight. He also eferred to the dangerous effects from using water drawn through common lead pipe, and advocated the passage of a aw which would prevent its emp'oyment in this capacity Ho was followed by several members speaking on the same subject, describing minutely the action of the poison and its different effects. Some persons are more susceptible to its injurious consequences than others, as is well known to be the case in regard to painter's colic and kindred complaints. Mr. Walling repeated the beautiful experiment lately per formed by Prof. Thompson of Edinburg before the Royal So ciety of Scotland, and described in the article on " wirbel be wegung" on page 212, current volume. These air vortexes re very frequently produced in nature and are made visible when smoke or steam is mixed with the whirling air. They may be seen when cannon are fired, particularly if the muz zle is "slushed" with grease, also as issuing from the smoke tack of a locomotive just starting : human smokers constitute perhaps the largest number of experimenters in this line Mr. Walling remarked that the molecular theory based noo this phenomenon by Prof. Thompson, was an indication of the tendency of scientific opinion towards some such purely dynamical theory as had been previoasly proposed by him self,

## Tin Lined Pipe for Water

On Thursday the 23d of May an exhibition of the method of the new manufacture of lead pipe lined with block tin was given at the manufactory of the inventors and manufac turers, foot of west 27 th street, New York. The visitors invit ed had an opportunity to witness the processes from the first casting of the core of tin to the production of the pipe in its finished state, and the sentiment was general that it was a complete success. We have no time nor space in this issue to describe the processes, nor to state the facts established by the experiments. In our next we shall endeavor to show the immense advantages of this over the ordinary water pipe.

The hardware manufactory of Sargent \& Co., New Haven, Conn., gives employment, at its full capacity, to 800 hands, and turns out 4,000 different articles of hardware to the amount of $\$ 4,000,000$ to $\$ 7,000,000$ per year.


ISSUED FROM THE U.S. PATENT OFEICE FOR THE WEEK ENDING MAY 21, 1867.
Reporteid Oflcially for the Scientitic Amerucan
atents are granted for seventeen years, the following On filing each Caveat

appeal to Commisisionerent of Patents..
application for Reissue............


It Canada and Nova Scotia pay $\$ 500$ on application.

64,826.-Device for Holding Cigars.-Charles Appel, Ho

 64,827.-Lime KıLN.-George Atkins, Sharon, Pa. Iclaim the arrangement of the lime kiln formed ofthe chambers. A B D
and heated by furnaces,
substantially as and for the purpose hiferent levels inside teve the kiln, operatiag 64,828.--HAY Presss.-George H. Aylworth, Brighton, Ill. I claim a hay press, consisting of the box, a, and the slidino partition, $k$,
operated by meansor oftco screws, b , the whole constructed and arranged as
herein shown and described. 64,829.-C
York City.

64,830--SEWING MACiINE.-Robert Barclay, Buffalo, N. Y


64,831 -Linuid for Carburetina Gases - Jo
sett, Salem, Mass.
sett, Salem, Mass.
I claim the by trocaron liquid for carbureting gases, produced by th
onbinaton and process described substantially in the foregoing spectica
on
64,832.-Peat Machine. - Alfred Bridges, Newton, Mass.

64,833.-Railway Switch.-James S. Brothers, Duncannon
Pa.
I claime the construction of the chair, K , with the adjustable frog, G. when
raned combined, and operated as herein described and for the purpose
64,834.-Quartz Mill.-Samuel C. Bruce, New York City. First, I claim the revolving wheels, C and D, with velocities varying in
ome regular ratio, so that wheel, D, shall always revolve faster than, and in

 , $4,835 .-$ SAF SET SET-Benjamin N. Butcher, Philadelphia, Pa

64,836.-Cane and Sorghum Stripperi.-James A. Camp bell, Stow, Ohio.


 64,837.-Porestacele Start for Dhivers upon Cans.-James F. Campbell and Cornelius Finney, Williamsburg, N. Y We claim the upright or staff. B, with hook at one end, and provided witl
hrod, fi, having seat, G , and sirap, H , substantially as and for the purpose
described. 64,838.-BotTle Stopper.-Horace S. Carley, Cambridge

 64,839.-WheEL Plow.-Elisha A. Chace, Rosemond, Ill.
 64,840.-Cloth-guide For Sewing Machines.-George F Clemons, Springfield, Mass.
First, I claim in a clota yuide for sewing maclines the employm ent with
cloth gage of a rigid guide olate addopted to bear upon the cloth in front o
he sewing needie, and extend across


 64,841. - Deodorizer for Privy Seats.-Ncil Clifford and
A. N. Bell, Brooklyn, N. Y.

 cherement of the seat, or both, the said disintrectant or deodorizer will be dis
descrinto the vault of the privy, etc., substantially as and tor the purpose
64,842.-
Md.

,843.-Railroad Rail. Fastening.-John Cochran, Wall
Township, N. J. Antedated May 13, 1867.



64,844.--STEAM Generator.-S. M. Colburn (assignor to
 64,845.--Manufacture of Gas. - Joseph H. Connelly, Wheeling, West Va

## 


 Fourth, The use of residu um oin ollolone, in coombination with lime, for the
production of indammable gas, desulphurized and whitened in the manner
see torth. 64,846.-Means for Steering Vesselis.-Robert Creuzbauer, New York City.
Firss, I clatim, in combination with a stering screw, or its equivalent, ar.
ranged within a pipe or water way extending transversely turough the hull




 64,847. - KeEper for Door Locks.-George W. DaCunha, of New York city.

## 

 the purpose set forth.64,848. - Hay Loaders.- Leopold De Lacee, Springfield, Ill.


 volving platform and raking device substantially as and for the purpose
Fowineth, The two palleys, $G$ G, connected by a clutch, and arranged as
Fous
 64,849.-Planing Machines.-William H. Doane, Gerritt V
Orton, and William E. Loudon, of Cincinnati, Ohio, as signor to J. A. Fay \& Co.
First, We claim the com remation of the adjustable break irons, $\mathrm{k}^{\text {' }} \mathrm{k}$ ', with
he cotters, k k, and the removable collars, hil, all constructed and arranged

 64,850.-Wheel Vehicles.-James W. Drew, Stockbridge 4,850.-Wheel Vehicles.-James W. Drew, Stockbridge,
Mich., assignor to J. N. Townson and James W. Drew, Antedated May 16, 1867.
I claim the crooked sway bar, H, and the cross bars, I and J, in combina-
tion with the axle, C. and the a de guides, G G, the whole constructed and
operating in the manner and for the purpose hereln described. 64,851.-Cocks.-Charles M. Alburger, (assignor to George I claim the follower, A, having its met
 64,852.-Converting Rectilinear into Rotary Motion.Jirst, I claim A. Ehle, Green Bush, Wisconsin.

## First, I claim converting rectilinear motion into rotary motion by the use

 forthi. The pins, f, forming h ooks upon the triangles, E , and the ba b , in
Third, The
comination substantially as shown and described.
Fourth, The cann wheel, L, in combination with the triangle, E , and the combination substantially as shown and described.
Fouth, The cand Whael, L, in combination with the triangle, E, and the
cear wheels, and $\mathbf{k}$, substantially as herein shown and described. 64,853.-Portable Roofing Boileli and Furnace.-Perry Fenlason, Cincinnati, Ohio
I claim the boiler, B, in combunation with the spring dray, , or its equiv
alent, constructed substantially as above described and for the purp ose set
forth.
64. 85. ATrachment to Stoves for Generating Gas.-
B. L. Fetherolf, (assignor to himself and J. N. Hea desty), Tamaqua, Penn.
I claim the hollow metallic block, A, fitted within the fire chamber of
Oove so to constitute both a gas generator and a lining or tire back, sub 64,855.-Putring up Oils in Casks, \&c.-P. G. Finn, Erie, Penn.
ecanded state, substantially as and for the purpose set forth.
64,856.-Edible Composition.-Daniel Fobes, (assignor to Fobes, Hayward, \& Co.), Boston, Mass.
I claim the edible conposition as made of the materia
the purpose substantiall
I claim the edible composition as made
or the purpose substantially as described
64,85̃7.-Extension Table.-George F. Folsom, (assignor
to himself and Charles F. Pease), Roxbur, to himself and Charles. F. Peasel, Roxbury, Mass
I claim the combination as well as the arrangement of an auxiliar






 64,858.-Mechanical Movement.-William Galladay, She-64,858.-MECHANICAL
boygan Falls, Wis.
1 claim the combination of
heel, A, as and for the purpose set $8, \mathrm{C}$, and pawls, E F, with the ratche ne connecting rod, substantiaily as shown inn and described.
4,859.---GIG MILLS.---Ernst Gessner, Aue, Saxony First, I Claim the construction and arrangement of the revolving disks, D,
in the adjustable frame, C substantially as described for the purpose speci-
ied.
 64,860.-Gates.-Robert D. Green, Columbia, Mo.


64,861.-Manure Drag.--Christian H. and Joseph H. Harn

we also claim the rake.dras, fifure 2, when ned in in onnection with said forl
drag in the manner and for the purpose set forth. 64,862.--Method of Propelling Cars, etc.--Charles T Harvey, Tarrytown, N. Y







 64,863.--Honse Hay Forks.-H. H. Hatheway, Clockville

 64,864.-Beehive.-B. S. and E. H. Havland, Fort Dodge
 for the purpose especiice.
64,865 . - Attaching Thiles to Vehicles. - Thompson Hersee, Jr., Butfalo, N.


 64,866.-Carriage Spring. - B. T. Henry, New Haven claim an ell
64,867.-F FASTENENNG For ShimT Collairs.-Frederick, Hess Baltimore. Mc.
 64,868.-Cultivator.-Jacob Hollinger, Millersburg, Ohio







64,870.- Hoor Sisirr.--William E. Houston (assignor to hine
self Geo. W. Hubbell and J. R. Lattin), Birmingham, Conn. $W$. Hubbell and J. R. Latur), Bimngham First, 디iaim securing the enoops to the tape by a clasp or other device in
 64,871.-Clasp For Hoop Skiress.-William E. Houston (ass
signor to himself George W. Hubbell and John R. Lat signor to himself George W. Hubbell and John R. Lat
tin) Birmingham Conn. tin), Birmingham, Conn.
chails securing the two ends of ho
Iclaim securing the two end of hoops by $a$ clasp corruated thereon dia
gonally and at reverse angles upon opposite sides,
substantually 64,872.-Tape of Hoop Skirts.--William E. Houston (ass
signor to himself George W. Hubbell and John R. Lat
tin), Birmingham, Conn
 64,873.-TAPE OF Hoop Skirts.-William E. Houston (as signor to himself George W. Hubbell and John R. Lat gham, Conn
 64,874.- Method of Making Balance Wheels for
Watches, etc.-Edward Howard, Boston, Mass.
 64,875.-Sugar Cane Stripper.-S. Terry Hudson, Success,


 64,876.-Washing Machine.-George R. Hughes, Centralia,
Mo.
 64,877.-SEED Planter.-D. H. Hull, Plantsville, Ct.




64,878.-Culitvator.-James M. Hume (assignor to himsel and C. F. Hoyt), Colchester, Ill.
 64,879.- ELVVELEOPE.-Ralph S. Jenniags (assignor to himself and N. G. Kellogg), New York, City.

 64,880 .-Permutation Lock.-A. W. Johnson and George Thompson, New York City.


$\underset{\text { clatain the combinination of the inclined wheel or trame, A, cylinder }}{\text { 64, }}$
lever shaft, E, when arranged togetherso asto operate together, substantially
in the manner and for the purpose described. 64,882.-PRUNiNG SHEASS.-Peter Keck, Zanesville, Ohio First, $I$ Ilaim the mode of attachment of the blades of a pair of shears com
posed of thre e evers, substant ially as shown and deser
 64,883.-Horse Shoe Machine.-John W. Kingsbury, New First. Iflarim, Mass.





 64,884.-Heating Stove.-A. Lee, St. Paul, Minn.
 64,885.-HoG HoLDER.-W. and C. Leffingwell, Clarksburg, We elaim,



 64,886.-DEVICE FOR Elevatine Ice.-Henry Litule, Mid claiit the rotatory scrow ele evator, in combination with the bearine 64,887. - Mode of Desulphurizing Iron Ore.-John Little


 64,888.-Haryester Rake.-John M. Long, Hamilton, Ohio

 64,889.-Cancelled.
$\underset{\text { Scolia }}{64,890-\mathrm{Car}}$ Coupling.-W. I. Mayo, Hillsburgh, Nova Scotia.

 64,891.-Can Opener.-T. A. McFarland, Meadville, Pa.
 64,892.-Solar Chronometer. - Lloyd Mifflin, Germantown, Pa .



64,893.-Grindstone.-Warren P. Miller, New York City.
 Seond, The grooves, dd, Fhen arranged in the grinding surface, substan
 64,894.-Door Indicator.-Francis E. Mills, San Francis $\underset{\text { First, } \mathrm{C}, \mathrm{Claim}}{\mathrm{Cl}, \mathrm{Cal}}$



64,895.- Steam Generator.-Thomas and Thomas H. Mitch-
ell, Albany, N. Y. ell, Albany, N. Y.
 tion with the pipe or pipes for supplying and jetting the water, sulustantially
ase
We aloso tol aim thime the sen borntition of the denerator rotating within the fur


 64,896.-Bolt AND Rivet Machine.- John Morgan, Jr.
 Serein shown and described for the parposese secitied.

64,897.- Box For Bluerna and other Powders.-George claim a Moss, Ne
 64,898.-Car Couplivg.-John II. J. O'Neill, New Haven.

 , ing so as to relieve the spring , substantially as her 64,899.-Portable Blacking Case.-Abraham W. Wough, New York City. Antedated May 16, 1867.
b.
 Secondi, 1 also olaim the feet, combined with the devices, in the manner so
as to form an even surface when closed. 64,900.- Knittivg Machine.-Arthur Paget, Loughborough,
Great Britain.




ing across pulley, by which the said catch block would otherwise be carried
roond
Fith

 Sis. ist, The plates, $\mathrm{E}^{\prime}$, of steel or other hard metal, in com bination with the



 64,991. - Bedstead. - Isaac Pedrick, Bridgeton, N. J.


 64,902.- Cafd Holden--Henry H. Pember, New York City.
 arthices, $F F$, when all are constructed of one piece of metal, as herein se 64,903.-Machine for Swaging Horseshoe blanks.-Chas
H. Perkins and Richard W. Comstock, Providence, R. I
 64,904.-Bolt Howerr.-Bacchus Perry and $\Lambda$ aron Cornish, we claim the L .
We claim the bolt holder constructed and operating substantially in the
manner and for the purpose herein desecribed. 64,905.-Collezder Boiler.-Benj. F. Porter, Manchester, First. Ic ciaim the perf orated boiler, A, with double I -sbaped slots, a, rest.

64,906.-Gang Plow.-L. O. Rockwood, Ottawa, Ill. I claim the adjustable extension joint, if. 4 , constructed substantially 64,907.-TruNK.-Columbus A. Rose, Columbus, Ga.

64,908.-Shate Fastening.- Duane A. Ross, New York City


 64,909.-Cotton and Hay Priss.-J. G. Roux, Raymond

64,910.-Hanging And Lockina Sash-Charles A. Schaefer (assignor to himself, Fritz Frillman, Wm. Wolfi and
John Schachtschober), Chicaro, Ill.
Ill
 64,911.-SASH Supporter.-Charles A. Schaefer (assignor to himself, Fritz Frillman, Wm. Wolff and John Schachts chober), Chicago, Ill.
 64,912.-SEED SowEr.-Elijah U. Scoville. Manluis, N. J. J.





 64,913.-Tir-cart Body Fastening--John E. Seavey, Ken. nebuukport. Me. assignor to himself and S. S. . . Bryant.
 64,914--Plow Pornt.-David J. Selden, Mount Vernon,


 and to old the point oits place on the tenon with either side up.
64,915 .
HorsTriva GEAR--
 64,916. -Manufacture of Iron and Steel.-Lorenzo Sibert, Mount Solon, Va.
I claim the Improved metiod or manuacturing iron and steel, substantially
as
herein deecor ibed. 64,917-Garden Cultivator.--George W. Smith, Mount
 64,918.-Car Coupling.-J. Smith and J. F. Irwin, La Porte,
 64,919.-Corn SHeller.-E. E. Stedman, Randolph, Ohio. I claim the jawse C , springs. E , as arraneed in con
A , for the purpose and in the manner describe.
64,920.-TEMPORARR RUDDER.-H. L. Stibbs, Savannah, Ga.
 64,921.-Car Coupings.-W. A. Stowell, Moretown, Vt.
 64,922. - Adjustable Eccentric: - James B. Strickland, Scranton, Pa .

64,923.-GAag PLow.-J. W. Sursa, San Leandro, Cal.

 64,924-Gate.-Jacob Vail (assignor to himself and John H. Linderman), Beloit, Wi




 64,925.-AtTACHing Burners to Lamps.-H. Weston, Tow
 64,926.-PLIANTER AND MANURE DITTRIBUTOR.-Ben jamin F. Whitner, Madison, Fa.






64,928.-EGG Beater.-Marvin T. Williams, Milwaukee,
Wis.
 64,929.-Stean Generator.-Joseph Woodruff, Rahway, First, I cilim the connection of two boilers by means of the pipes, DD
 64,930-CAR Sprivg.-Henry A. Alden, Matteawan, N. Y.

 64,931.-Barsee for Bits.-Charles H. Amidon, Greenfield,
Mass. Iclaimst the
shank of a bit brace, for the purposes set forth.
64,932 . -64,932.-Clowies Wringer.-Charles H. Amidon, Green-
field, Mass., assignor to the Bailey Washing and Wring-
field, Mass., assignor to the Bailey Washing

 64,933.-Coffer Dam and Boat.-William H. Applegate


 64,934.-SEparatiita
ward Balbach, Jr., Newark, N. J. J.

 64,935 .-Maching for Wiring Blind Slats.-Peter Barry'



 64,936.-Attachivg Carriage Thills.-A. R. Bartram, Redding, Conn.
 64,937.- - Lirmina JAck.-J. H. Bean, Marietta, Ohio.

64,938.-Lathe.-William B. Bement, Philadelphia, Pa



 64,939.-Life Preserver.-John M. Billhofer, Irvington,
 64,940--Oscillating Engine.--William E. Bird, New York
 the engine, substantially as described. 64,941.-Conbined. Back Sight and Cartridge Retracter
for Fire-arms.-G. W. Bowlby, Pontiac, Mich. For Fire-ArMs.-G. W. . Bowlby, Pontiac, Mich.
I claim the sight, F , constructed and used in combination with ti
 64,942.-Cariiage Trimming.-Charles Bried, Newark,
 64,943.-Heativg Stove.--Albert Brown, Troy, N. Y.

64,944.-Warp Eyes of Wire Heddles for Loom Harness. -Darius C. Brown, Lowell, Mass.

 64,945.-GATE.-John A. Burchard, Beloit, Wis.

 64,946.-LIFTING JACK.-Charles Butterworth, Miamisburg,
Ohio, assignor to himself and Jacob Kercher.


64,947-Aprapatus For Accumulating and Reclaiming
Heat-Thos. J. Chubb Brooklyn













 64,948.-Combined Grain Thrasher and Cleaner. Adrian Cornell, Newtown, Pa.



 64,949.-Liffing Jack.-Charles Crow, Onargo, Ill. First I claim the arrangement and combination of tiee movable steps, I
racks,, , and guides,
BC, when
wonstructed to operate substantially as and
 $64,9 \tilde{0} 0$.-Churn and Pump Power.-Francis Danzenbaker, Bridgeton, N. J.
 64,951.-Machine for Applying Animal Power.-Jonathan Dearborn, Seabrook, N. H. . .
claim the combination and arrangenent of the inclined shaft, A, the

 64,9ั̈2.-Hoors for Skirts.-L. De Forest, Birmingham, Ct I claim protecting the hoops of hoop skirts sya sucession of metallic
claspos sp spangles, in the manner and for the purpose substantialy as harein 64.953.-Saw.-Charles Disston, Philadelphia, Pa
 64,954.-Process of Treating Steel Blades, Etc.-Henry

 64,955.-Carriage Wheel Hubs.-L. Dorman, Worcester,

 64,956.-Auvtomatic Lubribator.-Isadore Dreyfus, New Y4, York City.
 64,957.-Sash Pulley.-Simon Drum. Allegheny City, Pa

 the whole bing constructed, arrangea, a,
described and for the purpose set forth.
64,955.-SUpport or Bearing for Friction Rollers.-
Stephen W. Eaton Farrington Me
Stephen W. Eaton, Farrington, Me.
claim the box, A. constructed substantilly


64,959.-Wooden Pavement.-Henry Fayette, Port Chester

 64,960.-Wooden Pavement.-Henry Fayette, Port Chester


 64,961.-Device for Lubricating Wheels, etc.-John C Fish, Barnstable, Mass
 64,962.-Marine Furniture.-Josiah Foster, Sandwich, Mass.
 64,963.-Machinery for Making Nails.--Thaddeus Fowler Seymour, Conn., assignor to the Fowler Nail Company, New Haven, Conn.



64,964.- Machive For Making Horse-shoe Natis.--Thad-
deus Fower,



Fourth, I claim the spring friction plate, $t$, in combination with the carrier
plate, h, and a fle for removing the side of the point, substantally as as spec
64,965-LLAMP BunNer- - John A. Frey. New York City.


64,966.-Machine for Sizing and Felting Hats.-E. R.
 64,967.-Gang Plow.-T. Elzare Gardiner, Bryantown, Md Tclaim - Gañ polout, constructed and operating in the manner substantially
as slown and d cescribed. 64,968.-Guide For Sewing Machines.-George D. Garvie Hartford, Conn
and 64,969.-A Atmospheric Churn Dasher.-J. C. Gaston, Cin-
 64,970.- Bridue Rein.-A. E. Graham, Richland, Ind. An-

 64,971.--ChurN.--Adelbert W. Gray, Bennington, Ohio
 64,972.-Rectrpocating Engine.-William D. Grimshaw
 64,973.-Bed Botтом.-C. H. Hall, Binghampton, N. Y.
 64,974.- PLow.-H. G. and E. L. Hall, Putnam, Ohio.





 $\underset{\text { We claim, First. In combination with the key tor arranging fhe tumbiers }}{64, \mathrm{~W}}$
 or trings ap at the exact point in both the locked or unockeci positions for
the admisision and withidrawal of the key, substantially as described. 64,976.-Window-sash Weight--H. A. Harvey, New York
 64,977.-Turbine Water Wheel.-Birdsill Holly, Lockport, N. Y.

 64,978.-Dfvice for Perforating Cigars.--J. Houghton,
New York City, and G . Wingfield, Brooklyn, N. Y.



 64,979.-BRoon Head.-William G. Hughes, Hebrow Ind. I claim, First, The con 8, 18 .

 64,980.-Tobacao Cutting Machine.-W. W. Huse, Brook-
 of 1 ts cutting edge to act on

 and 2 harpener and
purposes set forth.
64,981.-Seeding Cultivator. - Henry Hutchison, Three Rirst, Iclaim Mich. Mhe reversible cross shaped marker, 0 , constructed, arranged














 64,982.-Stationary Wash Basin.-Alfred Ivers, New York Iclaim the
Iclaim the pendant fange, d, and slot, e, in combination with the dam, i ,
and pipe, y , substantially as and tor the purposes spectitied. 64,983.-SHEEP RACE- - Heber G. Ives, Dunham, Conn.

 64,984.--Harvester.--Luman H. and George J. Jones, Bar-


64,985.-Harvester Pitman.-Jacob L. Kintner, Harrison
 74,986.-ORAAN.-George B. Kirkham, New York City.


 64,987 .-GATE.-Albertus Larrowe, Cohocton, N. Y.
 64,988.-WINDDW-SASH Eleventor.-John Le Ferre, Charlestown, Mass
 64,989. - Tmime Globe.-L. Paul Juvet, Glenn's Falls, N. Y.


 64,990.-Mode of Ageing Alcoholic Liquors. - Joseph Lloyd Martin, Baltimore, Md.

 auivalents, so as to treat alcoohoilic spirits, substantially as hersin described firsst, - Tclaim makin Shears.-Ebenezer Mathers, Eldiderville, Pa



 64,992.- Instrument for Preventing Incrustation of
Steam Boilers.-David Mathew, Prairie du Chien Wis.
I claim tiie employment within the boiler or cage or case, containing 64,993.-Heating Apparatus.-T. A. McFarland, Mead


## 


64,994.-BRICK.-Samuel McLaughlin, Philadelphia, Pa.
clatim bricks havinn ribibs and grooves arranged substantially as and to
the purpose hereinset forth. 64,995.-Manufature of Packing for Stuffing Boxes for Steam Engines, Pumps, etc.-Wm. Hartley Miller, ${ }^{\text {Phimladelphia, } \mathrm{Pa} \text {. }}$
Iclaim the combination of these materials in a packing forengines, pumps
etc, in the manner shown and described.
64,996.- Ротato Digaer.- Adam Minnis, Canton, Town ship, Mich.
Trss thamalim the whole combination of the machine, for the use and pur
poceona, f ciaim as new the shears, A A, etc. five or more, in shape and
 ${ }_{64,997 .-H A w s e}$ Pipe.- Parker Moody, Gloucester, Mass.


 64,998.-Combined Press for Cheese and for other PurPoses. - Christian Musselman, Somerset, Pa.

64,999.-BreECH-LoADING FIre-ArM.-Joseph and George
Henry Needham (assignors to James G. Gray), (London, Eng.
65,000 .- Machine for Making Type Mosds.- Mortimer First, Ison, New Yow York City.





 65,001.-Shingle Machine.-Elijah R. Osgood, Columbus,
Ohio. Firstrino claim the manner shown and described of constructing the movable
dogs of two parts, e e $e$, jointed together and held so by a plate, substantialls
 attached, ,2ll constructed and operatitng sibstantially as described,





65,002.-Composition for Ink.-Bernard Owens, St. Louis,
Mo

65,003.-Steam Engine.-Horatio O. Perry and John L. Lay Buffalo, N. Y.




65,004.- Hog Feeder.-I. S. Pope, Napoleon, Ohio.
First, I claim the
wheel, $G$, as arranged in combination with the box, A
 $65,005 .-V_{\text {apor }}$ Burner.--Alonzo W. Porter and J. Hamilton Brown (assignors to Alonzo W . Porter and James S . Gray), New York City.



 65,006.-MACHiNE FOR CUTTING Tobacco.-E. L. Pratt, Boston, Mass.
Io claim the sying ing arrier. the eutter, and the gaye plate, when arranged
to oporate totether substantially as sho mand and descaibect. 65,007.--F TRNITURE FOR VESSELS.-Samuel F. Pratt, Roxchary, Mass.
 Also ingeombination witit the foregocingo of one or more water-tight com 65,008.-Locomotive Engine.-Lucier Ratchaert, Paris France, assignor to Richard and Henty L. Norris, Phila delphia, Pa .



 shart and cranke
therein bet torth.
65,009.-Automatic Water Leaders.-Henry Reuch
Quincy, Ill.
 65,010.-Lamp Heaters for Vehicles.-Edwin H. Reynolds, Rising Sun, Md.
 seor the phe proses described. the above-mentioned casing, B, with a glas
 65,011.- VAPRR BURNER.-H. M. Richmond, Buffalo, N. Y.
 65,012.-Traction Evaine.-John B. Root, New York City
 dervies acting upon the Hheels conectected with the driving shaft of a loco 65,013.- Rotary Valve.- John B. Root, New York City.
 6̄̃,014.-Churv.-W. W. Sanborn, Lyons City, Iowa.

$65,015 .-$ Sash Support.-John N. Sawtell, Chicopee, Mass
 65,016.-VENTED FAucerts.-Henry Schild and Jacob Schild,
 65,017.-Attaching Carriage Thills.-Gottlieb Schreyer


 65,018.-Stean-generator Gage Cock. - Thomas Shaw
Philadelphia, Pa. Philadelphia, Pa.

65,019.-Insulating Submarine Cables.-George B. Simps.on, Washington, D. C.
I claim the combination of gutta



 purposes stated in the fore gonng specitication.
65,021 . SLEIGH BRAKE. - Henry Sipe, Sipesville, Pa .
 65,02.-Tou.-George W. Sizer, Brooklyn, N. Y.
Irciaim the combination of one or more whistles with the tor 65,023.- Paddle Wheel. - E. Spencer, Ottawa, Canada
 65,024.-Concrete Brick Maciune.-James Stewart, an David Windsor, Sandwich, Ill
 65,025.-Fence.-Jonathan Thomas, Mount Union, Ohio.
 langea bo claim the posts, A, constructed of bar iron in D form with the scribided, The springs, JJ, adapted and employed to operate substantially as

and ior the purpose set torth. | 65,026.- Cattle Pump.-Harris W. Thornburg (assignor to |
| :--- |
| C. W. Morrison), Morrristown, Ind. |




65,027.-Boot and Gatter Strap. - William J. Turner Utiaica, N. Y.

65,028. - Bed Bottom. -Charles Weed, Boston, Mass


65,029.-Brush.-A. M. White New York City
 65,030.- Harvester Rake. - William N. Whiteley, Jr., Springfield, Ohi






 65,031.- Horse Hay Fork.- Michael Winsler, Wm. Campwe clai, and Lyman Hardman,

65,032.-Manyfacture of Brown Metallic Paint.--Peter Winter, Horicon, Wis.
 65,033.-Valve for Stove-pipe Damper.-Gaius B. Wise-
 Secondind. The folding and revolving damper valve, constructed and operated
substantially as set forth and described. 65,034 --Watch.-Charles V. Woerd, Waltham, Mass.

 65,035.--MACHINE For MAKING- Evelets.-Solomon W
Young (assignor to himself, J. W.Hoard, and R. A. Den ison), Providence, R. I.

 65,036.-MAchine for MAking Evelet STociss.-Solomon
W. Young (assignor to himself, J. W. Hoard, and R. A W. Young (assignor to himself, J. W. Hoard, and R. A.



 Sixth, 1 alloo olaim theicombination as weil as the arraneement of either or
both the gulo stapes, with the die plate, the punch, and the feeaing mech.


## RE-ISSUES.

2,616.-Machine for Gudaisg and Printing Envelopes.Henry C. Berlin and George H. Jones, New York City
assignors of Thomas V. Waymouth. Patented June 12,






 2,617.- Photographric Albud.-William W. Harding, Phil adelphia, Pa., assignee by mesne assignments of Richar
Van Velthoven and Joseph H. Hazzard. Patented Oct. 17,1865 .
 2,618.-Cooking Apparatus and Refrigerator--Ignaz Newburg, New York City, assignee of Joseph and Ignaz


 2,619--Paprer Cutting Machine.-William Smith, South Windham, Conn., Executor of the estate of Enos P. Beck First, I claim the employment in a paper cutting mach











 2,620.-Harvester Raike.-Robert Bryson, Schenectady, N.
Y. Patented April 8 , 1862.













as escribed.
2,621 -Manufacture of Black Lead Crucibles.--Georg


## DESIGNS.

2,655.- Esign for a Cook's Stove.--John Abendroth, New 656 - Desici nefo-Design for a Carriagr Lamp.-Marcus DeVours-
newark, N. J. m- Desiay
2,657.-Desten for a Shaft Frame.-Adolph H. Rau, Phii a
2,6ä8--DESIGN For a Piano Stool.-Henry M. Ritter, (as
signor to M. Green signor to M. Green wood \& $\mathrm{CO}_{\text {. }}$ ) Cincinnati, Ohio

## EXTENSIONs.

Ornamenting Bottles.-L. Q. C. Wishart, Philadelphia, Pa. Design. Letters Patent No. 1,161. Dated Oct. 25,1 I Claim the ornamentaldesign, de
for Pine Tree tur cordial looties.
 of Sail veng-lift and Peak halifard block Providence, R.I. Letters Patent No. 9,619. Dated Oct 25, 1859.

 Machine For Pegaing Boots and Shoes.--J. J. Greenough
New York, City. Reissued No, 269, dated July 4,1854 New York, City. Reissued No. 269 , dated July 4, 1854 patent No. 10,427 . Dated Jan. 17, 1854.

Machine For Pegaing Boort and Shoes.-J. J. J. Greenough, New York City. Reissued No. 269 , dated Jury 4, 4854 .
Again reissued No. 699 (Div. 2.) dated April 26, 1859. Letters patent No. 10,427. Dated Jan. 17, 1854.


 | in succ |
| :---: |
| forthl. |

Machine for Pegging Boots and Shoes.-J. J. Greenough New York City. Reissued No. 269, dated July 4, 1854.
Again reissued
No. 700 , (No. 3) dated April 26 , 1859 Leters patent No. $10,42 \%$. Dated Jan. 17, 1854.



Machine for Prgeinge Boots and Shoes.-J. J. Greenough, New York City. Reissued No. 269 , dated July 4, 1854
Again reissued No. 701 (No. 4)
dated April 26,1859 Again reissued No. 701, (No. 4) dated April
Letters patent No. 10,427.
Dated Jan. 17, 1854.





Machine For Preging Boors and Suobs.-J. J. Greenough,
New York City. Reissued No 269 , dated July 4,1854, New York City. Reissued No. 269, dated July 4, 1854 Again reissued No. 702 (No. 5) dated April 26,
Letters patent No. 10,427. Dated Jan. 17 , 1854.




Machine for Praging Boots and Shoees.-J. J. Greenough
New York City. Reissued No. 269, dated July 4, 1854
Again reissued No. 703 (No. 6) dated April 26, 1859 Letters patent No. 10,427. Dated Jan. 17, 1854. Tcliim the pegering of boots and shoes with nails
 Weaving Corded Fabrics.-William Smith, New - Yor
City.-Letters patent No. 9653 , claim the process otacing a ibric by the ated thation
 Sewing Machine.-William Wickershan, Boston, Mass.Letters patent No. 9,679. Dated April 19, 1853.




Balancinge Slide Vatives of Steam Engines.-Robert
Waddell, Liverpool, Eng.-Patented in Encland, April Waddell, Liverpool, Eng.- Patented in England, April
27, 1853. Letters patent No. 10,999. Dated June 6, 1854.


 ackng anc small pasages
ectil and entirely balanineed
Sming Machine.-William H. Johnson, Springfield, Mass. Reissued No. 355, Feb. 26, 1856. Letters patent No
10.597. Dated March 7 1854 . Firstiviliaim the making of saceaz withan stinlic thread, by the eombina-







Knitting Machine.--John Mee, Lowell, Mass., assignor to Joln Mee and John Rourke, Lowell,', Mass., and G. Mack-
ennon, Portsmouth, N. H. Letters Patent No. 9, 718 . ennōn, Portsimouth,
Dated May 10,1853 .





Warp Knit Fabric.--Tno. of Mee, Lowell Mass., assignor to Jno. Mee and Jno. Rourke, Lowell, Mass, and G. Mackennon, Portsmouth, N. H. Letters Patent No. 9,719
Dated May 10,1853 . Dated May 10,1853 .


Machine for Shrinking Hat Bodirs.- Jas. S. Taylor ${ }_{3}$ Danbury, Conn. Letters Patent No. 9,700. Dated May

 Maching for Pointing and Threading Screw blayis.9homas J. Sloan, New York City. Letters Patent claim comb


## Inventions Patented in England by Americans

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 876.-SCrews.--Valentine Fogerty, Boston, Mass. Marcl 28, 1967
 883.-Loons..-Erastus B. Bigelow, Doston, Mass. March 26, 1367.


## EXTENSION NOTICES.

Charles Watt, of Putney, England, and Hugh Burgess, of Royer's Ford, Pa aving petitioned for the extension of a patent granted to then the 18 th day of October, 1858, and again reissued in two divisions the "th day of April, 1863 , for an improvement in process of treating wood and other vegetable substances in the manufacture of paper pulp. for seven years from the ex piration of said patent, which takes place on the 194 h day of August, 1867 , it
ordered that the said petition be heard at the Patent Office on Monday, the Sth day of August next.
Henry Ritchic, of Newark, N . patent granted to him the 23d day of Angust, 185s, for an improvement in lace on the e2sd day of August, 1867, it is ordered that the said petition b eard at the Patent Office on Monday, the 5th day of $\Lambda$ ugust next ion of a patent granted to him the 16th day of August, 1853 , for an ingere ent in socket for auger handles and braces for seven years from the expiraordered that the said petitiks place on the leth day of Kugst, 9th day of July next.

## NEW PUBLICATIONS.

Titm Art of Perfumery. By G. W. Septimus Piesse, Philadelphia: Lindsay \& Blakiston.
This book gives the methods of obtaining the odors or plants, and instruc is or the mandacture of perfumes, cosmetics, etc., upon which subject ravings and is neatly published.
The Art of Manufacturing Soap and Candies, Embrac ing Hard, Soft, and Toilet Soaps, the Modes of Detectin Frauds, etc., etc. By Adolph Ott. Philadelphia: Linc say \& Blakiston.
as it gives full accounts ot the different procsses tormaling their factur Map of Gmpin County, Embracing the Central Gold Region f Colorad
This map was drawn from surveys made last summer by Messrs. Chas. TW. 1,500 feet to the inch and shows the mountains, gulches, cañons, streams roads, and quartz mills,giving the names of the companies to whom the belong; it also gives many of the most prominent lodes. The lator and ex
pense ofmaking accurate surveys in this rough region is great, and thre nonths were devoted to its accomplishment. Only 200 copies have been pubwho have invested in mines in this region and also to miners either there or contemplating locating in that region. The price of this map is $\$ 25$ per copy, to be obtained of Gaylor
Blanchard, Chicago, ill.


 letters (post-paid), Publishers,
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