

A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY, AND MANUFACTURES. **\$3 per Annum**. [IN ADVANCE.]

Vol. XVI.---No. 6.

NEW YORK, FEBRUARY 9, 1867.

The " Miantonomoh."

Improved Windmill. Although the force of wind is an unreliable motor for some manufacturing purposes, yet it affords a cheap and ready means for driving machines the proper action of which does not depend upon absolute steadiness of motion. It has been

surface, or a ring with threaded stem set up with a lever nut. There are objections to both, especially when the tail stock is worn and the spindle becomes loose. The device herewith and is still extensively employed in some sections of this coun. | part has a coarse thread cut on it and the whole sleeve fits a | of her class that has visited Gibraltar, and is naturally the

The visit of the United States turret-ship Miantonomoh to Gibraltar called forth the following remarks in the Chronicle of illustrated shows a sleeve, A, enveloping the arbor, B, and the 15th Dec .:- "The American iron-clad turret ship Miantohaving the front end slightly cone shaped. The cylindrical nomoh, which arrived in this port yesterday, is the first vessel

try for pumping and other purposes. For service, at railway stations and on farms, it is a valuable aid to man. Much of this value, however, depends upon the plan and construction of the wind wheel or mill. The one represented herewith appears to be constructed on right principles and is calculated to work satisfactorily under all circumstances, whatever the force or direction of the wind. It is a horizontal wheel, mounted on a vertical shaft, and having eight fans or buckets hinged at their inner edge on uprights secured to radial arms. These fans are connected in pairs by pivoted iron rods so as to insure each one of each pair moving together when the angles of their inclination are changed. One fan of each pair has also a projecting brace, which connects by an iron rod with a bell crank lever on an upright bar near the central shaft. From this lever a rod passes down to an enveloping and sliding collar on the upright shaft, There are four of these bell cranks, one to each pair of fans, and by the raising or lowering of the sliding collar the fans are set at any required angle to suit the force of the wind. This collar is raised or lowered by a lever having a sliding weight by which its action on the colar can be regulated. This lever will also operate a lever brake

in case of a gale-being self-operating under great pressurewhich bears upon the run of the fly-wheel. At the foot of the vertical shaft is a beveled gear engaging with another on a horizontal shaft, which carries a balance wheel having a crank to operate a walking beam for pumping purposes. The wind wheel is inclosed in a circular frame having upright slats set at an angle, to divert or guide the current of air upon the fans, giving a rotary motion always in one direction.

The labor of raising water from wells for cattle is an onerous one. Where all the water used must be obtained from

wells sometimes of great depth-one hundred and more feet, as on the prairies-the task is no small one. It has been estimated that cattle ordinarily consume fourteen gallons per head daily. Twenty head of cattle-not a large number on a farm-will therefore consume about three thousand barrels of water annually. In such cases an apparatus like that illustrated in the engraving would be invaluable, and also for railroads where the water for the locomotives is drawn from wells. The inventor says that this machine will work equally well in a gale as in a moderate wind. At the late State Fair of Wis-



STRUNK'S WINDMILL.

It is slotted on the inside its whole length to receive a feather on the arbor as usual. The cone-shaped portion is cut through, to give it sufficient spring to close around the arbor when drawn back into the stock. C is a circular nutin a transverse recess which engages with the thread on the sleeve and has on its periphery tapped holes for receiving the handle, D.

By depressing this handle, as at E, Fig. 1, the sleeve is drawn back into the stock and holds the spindle with a per-

Fig. 2

object of much curiosity. The feeling that would be uppermost in most minds on first beholding this monstrum, informe, ingens, of the waters would be one of surprise that she should cross the Atlantic. Two huge turrets, the funnel and the ship's boats suspended on their davits high in air, are nearly all that is seen above water. The ship herself is a great platform rising little more above the surface of the sea than her own boats. Molière's fencing master says that the whole art of fence is comprised in two things-to hit your adversary and not to get hit yourself: the Miantonomoh seems constructed to carry out this doctrine in naval warfare. Her hitting apparatus, the two impenetrable towers with their Dahlgren 480-pounders, of which she carries two in each turret, is the only part she presents to an en emy, while the only part that he could hit to do her an injury is wisely screened below the waves, except the narrow rim that, like the tower, is invulnerable. We have not heard what thickness of iron is beneath the platform deck that supports the fighting part of the ship; but, unless the deck is made as invulnerable to heavy shot as are the sides and turrets, a vertical fire would still find a weak point in these formidable ships. If ever Gibraltar should be attacked again by floating batteries, they

corresponding recess in the stock. It should be made of steel. | will be of harder and less inflammable material than those employed in the celebrated siege. General Elliott's red-hot shot, instead of setting fire to the floating batteries of the present day, would fly off from their sides in a thousand glowing fragments, like the sparks from heated iron beneath the blacksmith's hammer. If, then, heated shot are useless, and cold shot cannot penetrate the sides of modern iron-clads, it would be a satisfaction, in case of attack, if our artillery could penetrate them in another way, by plunging shot upon their deck fect gripe, as it has a bearing around its whole circumference. from the level of the signal house or the rock gun. To send

shot through an attacking ship from top to bottom would be much more damaging to her than sending it through from side to side. After all, however, we cannot feel quite sure that our ability to launch a vertical fire against an attacking squadron will ever prove of practical advantage, There is just now the keenest competition between the science of attack and that of defence. Who knows whether an enemy attacking Gibraltar from the sea on some future day may not have provided his vessels with impenetrable iron roofs, beneath which he may hammer away at our walls quite regardless of the shot that is pattering overhead like hail upon the slates."

consin one of these machines

from a depth of more than one hundred feet. The lower part of the structure can be boarded in and roofed, making a convenient granary, store-house, or carriage shed; or the wheel can be erected upon any building.

The device was patented through the Scientific American Patent Agency Nov. 13, 1866. For further particulars address F. & D. Strunk, Janesville, Wis.

Improved Lathe Arbor Tightener.

The most common methods of securing the dead arbor of a athe at any point is either by a set screw bearing on its upper | Sixteenth and Callowhill streets, Philadelphia, Pa.



FAUGHT'S LATHE ARBOR TIGHTENER.

pumped nearly all the water used for the stock on the grounds, | If at any time the spindle, sleeve, or the recess in the stock is worn by use, the handle, D, may be unscrewed and placed in another tapped hole.

> The advantages of this device, so far at least as holding the arbor perfectly stiff is concerned, may be understood by any machinist. We regard it as a valuable device, as it cannot fail to keep the spindle always in line, and prevent the annoyances of finding the dead arbor out of line when set up. It is the invention of Luther R. Faught, who secured a patent through the Scientific American Patent Agency, Dec. 14, 1866, and who will reply to all inquiries in relation thereto. Address him at

150 FEET is understood to be about the maximum depth of the Straits of Dover. At this depth a leak in the proposed tunnel of only one square foot in area would require a steam engine of 1,600 horse-powor to overcome it, while the pressure on every square foot of the bed, and, of course, if the bed were soft and capable of transmitting the pressure, on each square foot of tunnel, would exceed four tuns.



AT the Oaks colliery, England, where so many perished, the workings reach to a distance of two miles, and the air-ways are sixty miles in length.

SILVER MINING IN THE GREAT BASIN.

We have been favored, through the politeness of the author, with a copy of a paper read by RICHARD WILLIAMS, Esq., before the Buffalo Historical Society, on the Great Basin with its Agricultural and Mineral Wealth. These personal observations of an experienced and practical eye, are interesting and instructive on whatever they touch. We reproduce a few leading points in a condensed abstract.

STRUCTURE OF THE BASIN.

The great chain of the Andes, extending the whole length of South America and the Isthmus of Darien, branches at the Isthmus of Tehuantepec, sending one of its arms up on the western side, very near the Pacific coast, under the name of the Sierra Nevada, in California, and the other to the eastward, under the name of the Rocky Mountains. These branches diverge to a distance of nearly 800 miles apart, and come nearly together again where they are lost in the Arctic Ocean. Thus they form an intramontane Basin of vast extent, nearly one-fifth of the whole continent, 5,500 feet above the sea, and having only three fluvial outlets-that of the Rio Grande on the south-east, that of the Colorado on the South-west, and that of the Columbia on the north-west. This basin is broken up by transverse ranges, like bulkheads or girders from rim to rim, forming inferior basins, two of which-that of the city of Mexico, and that of Great Salt Lake-have no visible outlets whatever. The latter is the great mineral basin, 400 miles square, mainly occupied by the State of Nevada, where the chief interest of these remarks centers. Here the rivers find their outlets in "sinks," and go down into the unexplored bowels of the earth. The lakes are "salt," and the flats are impregnated with alkali, which Mr. Williams attributes to the settling of the rivers, leaving their suspended soluble contents filtered out in the earth or deposited by evaporation. The soil is not silicious-a sandy desert-but contains within it every element of fertility except water, and produces abundantly wherever irrigated by nature or art.

THE GOLD AND SILVER MINES.

In this basin, above all occur those districts in which, throughout a square of ten to twenty miles, the rocky crust of the earth has been cracked in numerous fissures of unmeasured depth which the underlying volcanic ocean has injected and gorged with mineral treasure. These fissures are either entire, extending great lengths and to impracticable depths, and filled with silver-ore-bearing quartz; or they are but gashes in the surface, broken up by past convulsions which destroyed their continuity, and they cannot be followed to any considerable length or depth, or with continued profit. Appearances are very deceptive, being sometimes extremely flattering at an outcropping point, while the rest of the vein is barren. A true vein is not always rich; a rich vein is not always true, i. e. continuous. A fissure, both rich and true, is not always practically valuable for mining at the present day, from its remoteness or other difficulty of access, from the want of water, fuel, salt, or other supplies, from the neighborhood of hostile Indians, or the distance of any civilized community or from being covered with snow for two-thirds of the year. Difficulties from conflicting claims, crossing one another, sometimes occur. All these things, and more, have to be considered, and there is, in fact, but one way of getting at the certainty of any vein, and that is by personal examination of all the circumstances, and, regardless of representations from interested parties, mining engineers, or even eminent geologists, actually going down on the lead far enough to ascertain its true character, and by large assays determining the general productiveness of the ore. So great is the uncertainty attending these ventures at the best, that Mr. Williams thinks it the true policy for all who engage in silver mining to take up a sufficient number of lodes together to be morally certain by the average of chances that some one or other will pay.

SWINDLING OPERATIONS.

Everything, good, bad or indifferent, is recorded among the mining claims of a district, and upward of 4,500 such recorded locations are referred to by Mr. Williams in a single district where not a dozen of them at present would pay the expense of working. All the good claims are sold readily in the state : the rest are sent east and jobbed off by mining agents and organizers of mining companies of mammoth nominal capital. Mr. Williams lays it down as a rule, that no one can make a purchase of these unscrupulous speculators in mining property without being swindled every time. This can be done, according to the common ethics of trade, in a perfectly fair manner. No man is held bound to reveal the disadvantages of his property : if he states only the truth, he sells "fairly," when the whole truth (which the buyer does not usually undertake the difficult task of ascertaining) if told, would be fatal to the bargain. Scientific opinions, however honest and eminent, as to what is to be found in the bowels of the earth under a particular spot, are treated as of no value: and just as little worth is attributed to the advice of the so-called "experienced men." They never agree as to a uniform law, and their deductions are from a narrow and unscientific range of observation. Above all, our lecturer is severe upon a class of self-styled mining engineers, professors, etc., who infest the country, whose names are found in every yellow-covered prospectus, and whose favorable opinions can always be had for a consideration. Of all the mammoth millionaire prospectuses he has seen, not one but was filled with the grossest misrepresentations. Beware of all such enterprises as are associated with the names of distinguished military and scientific men, governors, politicians, bishops and doctors of divinity. These names are generally connected with a present of stock, which the recipient perhaps may value highly. But "good wine

and practically, without public proclamation and parade. You never see their prospectuses and their stock in the market, are bored with the one, or importuned to buy the other.

[Qur Foreign Correspondence.] WATER SUPPLY OF TOWNS.

LONDON, Dec. 29, 1866.

A variety of causes render the obtaining a good supply of water for the large cities here a more difficult problem than with us. Although the amount of annual rainfall is large, yet, as the drainage area is in no case large, the rivers are all small, and the water is made use of for manufacturing purposes. Then again, as the population is everywhere donse, the watercourses are all unavoidably contaminated with sewage, and though by acts of parliament towns and villages situated on rivers from which water is taken for city_use have been prohibited from discharging their sewage into the streams, yet the impurities that will in any case, even with the strictest regulations, find their way into rivers flowing through such a country as that in which the Thames, for instance, lies, make it impossible to obtain potable water from such a source.

THE ISLAND TOO SMALL-WATER SUPPLY LIMITED.

As these rivers also are mere brooks, and the cities large and numerous, and as the water is claimed by the many manufacturing establishments situated on their banks, it follows that the amount which the water companies are able to supply to the towns is very inadequate for all the purposes to which it would be applied were the supply more abundant. This is strikingly shown in the relative amounts consumed daily per head of population in London and New York, being at the rate of about 33 gallons per head in the former city against 60 gallons in the latter. No doubt in New York, where the supply is so copious, a large proportion is wasted, but it is a luxury to feel that it may be wasted to some extent with impunity. To guard against waste, the water is not kept at constant service in the mains, but a certain quantity is supplied each day to the houses by "turncocks," who allow the water to run for a few minutes from the main into the service pipes of the dwellings, the water being received into tanks, and the supply is then shut off for the day. Although these tanks may contain enough for a day's use, it is evident that the knowledge that the amount is limited will enforce economy in its use. But as stated in my last this is a serious inconvenience in case of fire, as it is often necessary to hunt up the turncock at a time when every moment is precious. On Sundays some companies do not supply water to their customers.

EXCEPTIONS-MANCHESTER AND GLASGOW.

There are some cities, however, which are more highly fa vored in their water supply and present a pleasing contrast to London and the majority of the large cities. Such are Manchester and Glasgow, in the latter of which especially the water is excellent in quality and very abundant. The works for the supply of this city are, I think, the most extended of any in Great Britain. The water is drawn from Loch Katrine and those who have visited that charming lake as tourists will not have failed to be struck with the remarkable clearness of the water, objects being plainly visible on the bottom at a great depth. It is conducted a distance of forty miles to the city through two cast-iron mains.

NEW SCHEMES FOR LONDON.

There are at present several plans being brought forward with considerable earnestness for procuring a better supply for London, and no doubt some of them will eventually be adopted. One plan is to build an aqueduct more than two hundred miles in length, or rather a succession of aqueducts connecting together some of the lakes of Westmoreland (or as we commonly call them in America, "the English lakes") and conducting the surplus water to the metropolis. Another seeks an adequate supply in Wales: but while there will be great discussion in Parliament as to what plan shall be finally decided upon, there is no difference of opinion that some other source must be found than those now depended upon.

PRESENT LONDON SYSTEM-FILTRATION.

At present London is supplied with water by eight private companies, each supplying a certain district and drawing their water from the Thames and the sea. In all cases it is

owned by quiet unpretending men, and carried on, financially | rial, the water welling over the top of this delivery pipe upon the filter. In the coarse gravel at the bottom are imbedded perforated pipes laid with open joints arranged as lateral branches of a central main, and these receive the water as it percolates through the gravel, and deliver it to the pump wells. The amount of impurity removed from the water by these filters varies largely with the season of the year. In summer the surface of the water in the reservoirs previous to filtering is often thickly covered with green vegetable matter, which forms with great rapidity. The upper film of sand requires cleaning on an average once a week. For this purpose the bed is emptied of water by a centrifugal pump, or otherwise and a layer of sand about three eighths of an inch in thickness scraped off and taken to be washed. Once a year the whole bed is made up anew. The washing is effected in a number of ways, one being by placing the sand in an iron cylinder seven feet six inches in diameter and three feet deep, having a perforated false bottom under which water is admitted under some pressure, and flowing up through the sand, stirs it up thoroughly and carries off the impurities as it flows over the top of the cylinder, the sand by its gravity remaining. When the water flows over clear the process is stopped and the remaining water drawn off by a cock. Another plan is to allow the sand to flow with a current of water down a flight of steps, the sand being caught in shallow ditches at the bottom while the water flows on with the impurities. Or again, a revolving cylindrical screen slightly inclined may be employed, a stream of water being admitted through the central shaft under pressure and allowed to play upon the sand, which is gradually washed through the meshes, while any lumps or stones are retained and fall out at the lower end of the screen.

PUMPING.

The pumping engines in use are of two classes, viz : Cornish and compound cylinder rotative engines. The advocates of each claim the superiority for their favorite style, and practically there is very little difference in the economy with which they work. On elaborate trials to ascertain their duty, they have raised from eighty to eighty-four million pounds of water one foot per hundred weight of Welsh coal, but with the ordinary Newcastle slack commonly used the duty is not seventy millions. The largest of the Cornish engines is at Battersea, being 112 inches diameter of cylinder with 10 feet stroke: it raises a weight of 75 tuns on a plunger 50 inches diameter. The steam is cut off at '45 of the stroke. There are five other engines in the same building, with cylinders from 55 to 70 inches diameter, the latter being a "bull," or engine with the pump directly under the steam cylinder, and worked directly by the piston rod. Steam is furnished by 19 boilers, from 28 feet to 32 feet long and 5 feet to 6 feet diameter. The cylinders are all steam jacketed.

The rotative engines have the high and low pressure cylinders close together and connected to the same end of the beam, the high pressure piston taking hold nearer the center, and hence the strokes are unequal. The expansion in these engines is eightfold, the steam being cut off at half stroke in the smaller cylinder. A number of this class are of the following dimensions :- High pressure, cylinder 28 inches diameter, 5 feet 3 inches stroke; low pressure, cylinder 46 inches by 8 feet stroke. The pumps are of the bucket and plunger type, with a stroke of 7 feet, the buckets being 24 inches diameter, and the plungers 17 inches, or half the area of the bucket. The pressure of steam is 40 lbs. The pump valves are of the double beat construction, with brass and soft metal bearings. In other cases wooden seatings are used. The steam pistons are packed with steel rings three quarters of an inch square, on Ramsbottom's plan: these are used in cylinders up to 60 inches diameter.

The engines pump the water through mains to reservoirs near the city. These are almost invariably covered, brick arches being used for this purpose. Some of the works also pump a supply of unfiltered water to be used for street watering in summer. The water works show a good deal of firstrate engineering, but the supply is intrinsically only passable. SLADE.

[For the Scientific American.] HOW SHALL WE BURN COAL MOST ECONOMICALLY ?

The smoke burning apparatus of Messrs. Roby, illustrated in the last number of the SCIENTIFIC AMERICAN, has caused some comment in English mechanical journals. The necessary to employ pumping engines, as there is no natural results are declared incredible and the principle paradoxical. head, and many of the companies pump their water twice It does not seem so to me, for reasons which I shall state over. The drainage area of the Thames above Staines is 3,086 presently. The invention is simply, as may be seen by the

square miles, and its mean annual discharge is 900,000,000 Thames, and are authorized to withdraw altogether 100,000,-000 gallons per day, the minimum flow of the river being estimated at 362,000,000 gallons per day. In most cases the water is taken from the river directly into subsiding reservoirs constructed directly on the river side, but in some works it goes immediately to the filter beds. The necessity for the use of these is quite imperative, as was clearly shown last summer, when some of the severest ravages of the cholera followed the delivery by one of the companies of unfiltrated water to its consumers.

They consist of a series of layers of gravel and sand of about five or six feet thickness in all, the arrangement being about as follows :- First, coarse gravel about twelve inches in depth is laid on the concrete bottom of the bed, and upon this nine inches of rough screened gravel, followed by nine inches of fine gravel, or in some cases six inches of cockle and other shells: upon this again is a layer of coarse sand twelve inches thick, and lastly fine sand two or three feet thick on top of all. The water is admitted by a main passing through the bed needs no bush." The few, very few really valuable mines are and having a vertical branch rising above the filtering mate or burned to waste, which is just what I desire to say.

engraving, a device to reduce the tube area at the smoke-box per day. Five of the companies take their water from the end, by contracting the orifices of the tubes, thereby choking the draft apparently, and, as it would seem, retarding the combustion in the fire-box. That this result does not follow we have the public statement of Messrs. Roby; and from my own convictions I have no doubt of great economy from the use of it. It is generally conceded that but a tenth part of the heating power of fuel is utilized, the rest being dissipated in various ways: it is lost, at all events, to the pocket of the manufacturer. To save a portion of the missing nine tenths has been the object of inventors for many years, but in my opinion more attention has been given to devising peculiar shapes and motions for the steam engine to cut off the steam at any desired point of the stroke than in seeking greater economy by more perfect combustion in the boiler.

While such inventions are both desirable and necessary, it seems to me that in this respect the steam engine is as near perfect as possible, and that the proper place to save the fuel is in the boiler, a good steam engine with a good variable automatic cut-off being assumed in all cases. This is only another way of saying that fuel is improperly burned,

or artificial draft, we can urge the combustion of fuel and yet to the edge of a bench or table, having its trough for water, retain the heat or detain it from being driven off before it has its rest for the implement to be ground, and a scraper or degiven up its calorific power-if, I say, we can do this at a tainer to prevent the water from escaping by centrifugal force. moderate cost, we shall obtain something approaching perfect | The stone was a real grindstone, and the frame was of brass, combustion, and far greater economy than we have at present. | a perfect working model, complete in every part, yet weigh-A steam boiler furnace is in the nature of a retort for distilling the gases from the coal and applying them to the of space. One was the effort of a man who either possessed evaporation of water : but from its defective construction the small mechanical abilities or felt no pride in his handiwork, gases are allowed to pass off without being ignited and the principal agents from which heat is derived are lost. In Siemens's furnace and in some others the gases are consumed in a combustion chamber, which is supplied with air when the gases are at a proper temperature to ignite, and great economy is the result. The same principle has been adopted in other ways, and the value of a given quantity of fuel noticeably enhanced. It has even been applied to cooking stoves with good results.

to the detention of the products of combustion in the flues (not in the smoke box as many do) until they are at the proper temperature to ignite. This view seems to me reasonable from the fact that the smoke is consumed. Smoke contains not only the watery vapor evolved from the incandescent fuel, but also pure carbon in the form of soot, which is nothing but unburned coal and is usually deposited along the surface of the tubes. In this boiler, however, no soot forms, for the simple reason that none is made: it is burned with the gases in the furnace before it is "born." I do not think that this apparatus would be universally successful in all cases, as the temperature at which the gases would ignite without escaping from the boiler would depend greatly on the length of the tubes and the diameter of them, also the velocity with which they passed through the tubes. The velocity could of course be regulated by the dampers, for such they are in effect.

Many years ago an apparatus similar to this was invented, having the same object in view. It consisted of a series of slats like a Venetian blind, hung in such a way that the exit of the gases was delayed, but I know nothing of its efficiency.

It would also seem that this boiler must be fired or run for some little while as an ordinary boiler before throwing the dampers into gear; so as to allow the tubes to get hot enough to perform the office which is demanded of them. The increased evaporation may also be simply owing to the retardation of heat in the boiler by the dampers, checking the flow, as it were, and compelling it to give up its virtue: but in this case, unless combustion were nearly perfect, the tubes would soon be stopped with soot. No doubt if air in jets were admitted to the flues the result would be still more satisfactory.

I have no doubt but we shall find in the future that multitubular boilers are imperfect both in point of expense and heating surface. If we can get the same amount of fire surface in another form, I do not see any good reasons for continuing to use many-flued boilers. They are always leaking, get clogged with soot unless anthracite is used, are in no wise efficient in proportion to the amount of heating surface exposed to the fire directly and of that most remote from it, and are always a source of anxiety.

I do not see any reason why a funnel turned bottom side up would not represent a plan for an economical steam boiler. In this case we should have enormous grate surface which would enable us to carry light fires instead of piling coal on a foot deep as is universally the case. We should then roast the gas out of the coal and burn it in the boiler, not at the top of the chimney as is now done; we should have large fire surface, plain in form, to which no soot could adhere, and if necessary we might fill the top with short flues that could be casily cleaned and repaired and in which there would not be 600 degrees difference in the heat at the ends, as is now found. I noticed a boiler of this general plan in a late number of the London Engineer, as built by Messrs. Shand & Mason: but this design was made by me and described to the Editor of this paper a long time before the engraving appeared. This form of boiler would not require to be so large for a given efficiency, I think, as a locomotive boiler, (though I do not assert this for I have made no calculation) and could be as readily braced as any other generator.

Economy of fuel is a question of the greatest importance, and it seems to me that appliances, such as cut-offs, are often mistaken for principles, though I do not wish to be thought hostile to working steam expansively in saying so. I am confident that we are on the eve of reform in this respect, and that where we at the best evaporate ten or twelve pounds of water for one pound of coal we shall increase the evaporation four fold. EGBERT P. WATSON. New York, Jan. 23, 1867.

If by any means whatever, by the employment of natural hold and shop purposes, which could be secured temporarily ing less than one ounce, and occupied less than a cubic inch and the other was the product of a true mechanic.

Editorial Summary.

AMERICAN GREATNESS .- If the Yankees have acquired the name of great boasters they may be excused on the ground of having so much to be proud of, even in the natural features of their country. The greatest cave in the world is in Kentucky; the greatest river and the largest valley in the world The efficiency of Roby's apparatus is in my opinion owing are the Mississippi river and valley; the largest inland sea of the world is Lake Superior; the greatest mass of solid iron is the Iron Mountain of Missouri; the Falls of Niagara is the greatest cataract in the world; Chicago is the largest grain port and lumber market ; New York has the largest acqueduct in the world, while Pennsylvania contains the largest deposits of anthracite, and Illinois the greatest extent of bituminous coal fields in the known world.

> THE FIRST SUBAQUEOUS TUNNEL IN AMERICA .--- Chicago. having made a good beginning, goes on tunnelling. The next work in order is a tunnel under the Chicago river, where it is crossed by Washington street, which will be 1,800 feet long, having two passage ways for trains, each eleven feet wide, with a third for general purposes. The masonry will be protected by a heavy sheathing of lead. Instead of boring under the bed from the ends in the usual way, this tunnel will be constructed by sections in coffer dams, taking up a portion of the river bed at a time, so as to obstruct navigation as little as possible. We see it stated that the contractors have agreed to complete the work in March, 1868, for \$271,646.04-mills, we suppose, not counted.

OUR WONDERFUL CLIMATE.—Here we are in the midst of what is conventionally called "winter," with roses blooming in the open air, strawberries ripening as in summer, orange trees in blossom where there are any orange trees at all, bouquets of open air violets selling at a bit on the streets, second crop apples that have just ripened exhibited in market, and grapes that have never suffered from contact with sawdust, still plump, plentiful and cheap at all the fruit stands. Gardening to supply the city with early vegetables has actively commenced around the bay, and young radishes and green peas can even now be bought at luxurious prices. Winter! The word should be abolished from our vocabulary as a superfluity.-San Francisco Bulletin, Dec. 29th.

MERCURY IN HUMAN REMAINS .- A French journal relates a story of a wealthy farmer who died many years ago, and on digging a grave in close proximity to where he had been buried, the bones were accidentally exhumed. On examination brilliant particles of a metallic luster were found, which on being collected presented a considerable quantity of oxide of mercury. Thus for thirty-five years the mercury had been preserved almost without alteration in the body of the deceased who had probably made frequent use of the metal during the latter part of his life.

MORTALITY AMONG MINERS .- In the county of Redruth, England, which abounds in copper mines, it is stated that in every 100,000 of the population 220 males annually die of pulmonary diseases more than females, This is not so bad as in the lead-mining districts where the excess is 320 in every 100,000 and the death rate of men is double that of women. In the tin-mining districts of Penzance the superior waste of male over female life in the mining population of all ages is 104.

SUBTERRANEAN CITY RAILWAYS .- The London tunnel railway, with its enormous cost, from peculiar local conditions, of five and a half millions of dollars per mile, has paid from the start, five per cent in 1863, six and a half per cent in 1864, and seven per cent in 1865, which are considered very large returns for money invested in England. Over twenty millions of passengers were conveyed by it in 1866.

NATIVE SILVER.—The most celebrated silver mine in Europe is that of Königsberg, in Norway, which is 180 fathoms deep. In the Museum of Natural History at Copenhagen an enormous mass of native silver is on exhibition, taken from this mine, which measures six feet in length, two feet in width, and eight inches thick, and is estimated to contain five hundred pounds of pure silver.

SMALL ARMS IN THE WAR.-A report by the Chief of Ordnance shows that the Springfield armory furnished 801,997 new rifled muskets, of calibre .58, for the suppression of the rebellion, average cost \$11.97; besides 670,617 of the same description purchased of American manufacturers at \$19.23 and 54,117 at \$28.15: 393,961 breech-loading carbines were purchased of American manufacturers at an average of \$22.73, and 359,449 revolvers at \$15.92, with 548 at \$6.10. Foreign arms: 428, 292 Enfield rifles, at \$20.07; 736,049 other muskets at \$13 66; 10,251 carbines at \$6.90; 12,374 revolvers at \$16.57. This foots up nearly three and a half millions (3,467,655) of small arms of all sorts and sizes.

STATIONARY-ENGINE PLOWING .- Mr. James Howard, the implement maker of Bedford, Eng., patents a mode of working two gangs of steam plows or cultivators by two stationary engines on opposite sides of a field. Each engine has two winding-drums, one connected with each gang, by means of which each is drawn to the meeting point in the middle of the field by one of the engines, and then drawn back by the other engine while the other gang goes forward ; all without shifting the connections.

A FRENCH FIRE ALARM, invented by M. Robert Houdin, the well known ex-conjuror, is set in operation by the action of a very slight degree of heat upon a thin metallic strip formed of a ribbon of copper and another of steel, soldered together by their flat surfaces. The copper expanding by warmth more than the steel, bends the strip so as to bring it in contact with a conductor and complete an electro-magnetic circuit, causing an alarm bell to ring continuously as long as the warmth is kept up.

EXTINGUISHING FIRES by the gaseous products of combustion, is an expedient which has been brought forward in England by Messrs. Dawson & Broadbent. They propose to connect buildings, by means of pipes similar to the gas system, or otherwise, with reservoirs of gas collected from furnaces and cooled, from which it can be driven by steam power into any apartment in which a fire may occur; thus displacing and shutting off the supply of oxygen by the energetic interposition of incombustible gases.

SALT ON CITY CAR TRACKS .- One who knows, a Philadelphia conductor, says that to protect his feet from cold when the tracks are salted, he is obliged to wear boots that are not only double-soled, but that have two thicknesses of upper leather, and over these a pair of extra thick fur-lined moccasins, and even then he suffers from extreme cold." The City Council has prohibited the use of salt in the streets.

THE ELECTRIC LIGHT has been used on a large scale in the construction of the Northern Railway of Spain, to enable work to be done by night during hot weather, as well as in tunnelling, where the absence of ordinary combustion and its products proved a great advantage. The entire expense involved in illuminating a space of 4,000 by 1,500 feet did not exceed, as reported, \$1.75 per hour.

FIVE SNOW STORMS have been experienced at New Orleans, in 87 years. In December, 1800, snow fell for the first time in twenty years. Snow again fell in 1817, and again on New Year day, 1822. The next snow storm was on February 8th, 1831, after which twenty-one years elapsed before the next snow storm occurred, in 1852. Since that period no snow has fallen in Louisiana.

A NEW COMPETITOR IN SUGAR .- The Sandwich Islands exported 3,005,603 pounds in 1862, and 5,262,112 pounds in 1863, and in 1864 the exportation almost doubled, having reached 10,414,441 pounds. New sugar plantations are constantly started, and the area of sugar land as yet untouched is very large.

THE GOLD AND SILVER PRODUCT .- The report of J. Ross Browne, Special Commissioner on the mineral resources of the States and Territories west of the Bocky Mountains. gives an estimate of the product for 1866 of gold and silver at \$106,000,000 from California, Montana, Idaho, Colorado, Nevada, Oregon and other sections.

GOLD MINING IN VERMONT .- Parties interested report that from four to six mills will probably be put up next season at Bridgewater, Vt., for reducing the quartz of that region, and that a yield of from \$15 to \$30 per tun is expected. Work has been going on constantly during the past season, and four or five new and promising openings have been made.

VARYING IDEAS OF MODEL MAKERS.

In our last issue we spoke of model making as a business, and alluded to the beauty of which models are capable. It is singular to see what varying and sometimes crude ideas persons who attempt to ultimate their notions into visible forms have in relation to what constitutes a proper model. We have frequent opportunities to judge upon this subject. One of the most remarkable comparisons came under our observation a few days ago. One of the models was a simple household device, capable of being a working model if made no more than one inch square, yet it occupied almost as much room as an ordinary wheelbarrow, and was built in the most clumsy manner, of inch boards, fastened together with large nails, and betraying, in shape and workmanship, the clumsiest and crudest mechanical ability.

The other was a model of models. A grindstone for house- on record.

PHOTOGRAPHERS who use large quantities of nitrate of silver should allow all the excess of silver acetic acid and other matters from the plates undergoing development to run into stone jars containing fragments of zinc. By this means the metallic silver may be collected, digested with dilute sulphuric acid, washed and dried in the oven, and thus by a little pains quite a large saving may result.

STREAKY WEATHER .- During the tremendous rain storm of December 20th in California, a curious exception is reported to have occurred at Fair Oaks, near Menlo Park, where for the greater part of the day little rain fell; men plowing in their shirt sleeves while torrents were falling at San Jose and Redwood City, on both sides. The rainfall at San Francisco was 7.16 inches in 20 hours nearly double the heaviest

SKATING GIRLS .- A young lady of fifteen summers (not winters) skated one day this winter from Minneapolis to Dayton, 40 miles, in six hours. Another miss of the same age is performing fancy skating to the admiration of large assemblies in western cities.

BREECH-LOADING RIFLES.—About eighty a day of the new breech-loaders are now being turned out at the Springfield armory, and the number will be constantly increased until in February two hundred will be the daily production.

THE PRUSSIAN LEGISLATURE voted to Count Bismarck \$375,-000, and to the war minister and five generals, 150,000 each, in acknowledgment of services in the late war. The presents were delivered on Christmas eve.

THE LONDON TELEGRAPH boasts a daily circulation of 138,-704 copies-the largest daily newspaper circulation in the world.

HEAVY PUNCHING .- The patentees of the punched gun manufacture have punched a $10\frac{1}{2}$ in. hole down through a steel ingot four feet high and weighing three tons.

Scientific American.

[Feb. 9, 1867.

Improved Metallic Cotton-bale Fastener.

Metal bands are fast superseding the use of ropes to fasten bales of goods, and especially for the purpose of securing raw cotton. It is well known that a bale of cotton as usually compressed is not readily combustible. It is only when the fastenings become loosened, allowing the cotton to spread and the air to permeate its mass, that free combustion is possible. If the fastenings are of rope-often tarred, or if not, of a loose texture-they soon burn away and allow the elasticity of the cotton to open its fibers to the flame. When the bale is opened the rope is frequently unfit for using again, and as junk, is worth only about 33 per cent of the value of the iron bands. But metallic bands, as used with this fastener, it alty reports from two of the most eminent iron testers, in is claimed, can be used over and over again.

The device consists of clasps, A, of metal-malleable iron being most suitable-in combination with bands, B, of hoop iron. The clasps may be of two forms as shown. Each has its peculiar advantages, although both are constructed on the same principle. In one form one end of the strap is passed through a curved slot, and in this the clasp can be removed by turning only one way. In the other, the perfect Cshaped, both jaws are alike and it can be turned either way, opening from either end of the strap.

The bale, * being under pressure, one end of the band is psssed around it and bent as shown at C. the other being bent at the

proper point when the jaws are slipped through the loop. were, on being tested by them, found to be of even better These loops may be riveted if desired, although the grasp of the fasteners is such that it is not considered necessary. The bearing of each jaw on the loop is perfectly square, as seen, preventing any accidental disengagement. When it is required to loosen the bands to open the bale, it can be done by means of the holes seen in the face of the couplers. By inserting a cotton hook in these the fastener may be easily slipped, when it and the band are ready to again do duty as fasteners.

The device is the subject of patents in this country and Great Britain, a United States patent having been obtained Oct. 20, 1866, and an English patent Oct. 29th, same year. The patentee is desirous of disposing of the entire right, Address Arthur Barbarin, Lock Box 691, P. O., New Orleans, La.

The Composition of Alloyed Metals.

Below are a few of the alloys commonly used in the arts :-Chinese White Copper.-Copper, 40.4; nickel, 31.6; zinc, 25.4; and iron, 26 parts.

- Manheim Gold .- Copper, 3; zinc, 1 part; and a small quantity of tin.
- Bath Metal.-Brass, 32; and zinc, 9 parts.

Speculum Metal.—Copper, 6; tin, 2; and arsenic, 1 part: or copper, 7; zinc, 3; and tin, 4 parts.

- Hard Solder .-- Copper, 2; zinc, 1 part.
- Blanched Copper.—Copper, 8, and arsenic, $\frac{1}{2}$ part.

Britannia Metal.-Brass, 4; tin, 4 parts; when fused, add bismuth, 4; and antimony, 4 parts. This composition is added

at discretion to melted tin.

part.

Plumber's Solder.-Lead, 2; tin, 1 part. Tinman's Solder.-Lead, 1: tin, 1 part.

Pewterer's Solder .- Tin, 2; lead one part.

Common Pewter.-Tin, 4; lead, 1 part.

Best Pewter.-Tin, 100; antimony, 17 parts.

A Metal that Expands in Cooling.—Lead, 9; antimony, 2; bismuth, 1 part. This metal is very useful in filling small defects in iron castings, etc.

Queen's Metal.-Tin, 9; antimony, 1; bismuth, 1; lead, 1 part.

Mock Platinum.-Brass, 8; zinc, 5 parts.

Ring Gold.—Pure copper, 61 pwts.; fine silver, 33 pwts.; pure gold, 1 oz. and 5 pwts. Mock Gold.-Fuse together copper, 16; platinum, 7; zinc 1

and, after a long correspondence and numerous official reports, their lordships have upheld the decision of their officers. The standard of excellence insisted upon by the Admiralty is that the plate iron shall stand a strain of from 20 to 22 tuns to the square inch with the grain, and 18 to 20 tuns across the grain-a degree of excellence which, under the trials with the apparatus in use at Chatham, the iron rejected has failed to attain. The contractors, however, assert that the iron thus rejected is superior to the standard laid down, and refuse to submit to the dockyard tests, which, they contend, are not to be relied on, inasmuch as the testing apparatus is imperfect. In proof of this they have placed in the hands of the Admirwhich the samples of iron rejected by the dockyard officials

The pressure downward on the handle, E, not only moves the platen and cutter, but operates the pawl, G, thus rotating the wheel, B, and bringing forward the stamp to position. The upward movement of the plungers does not rotate the feed wheel as the pawl is prevented from acting by a minute coiled spring under its upper end. Its operation can be readily understood by an examination of the engraving.

Application for a patent is pending through the Scientific American Patent Agency, by C. B. Sill, Wilkins P. O., Pa. Address as above or at 308 North Sixteenth st., Philadelphia, Pa. BATCHELLER'S HAND PLANTER.

Those of our readers who twenty years ago were engaged in the operations of the farm can well remember the wearisome labor of dropping the corn from a bag suspended to the waist, the care required to place every kernel in its proper position, the difficulty of this performance on a windy day, and



the annoyance of seeing the corn come up in straggling blades, some in and some between the hills. All this is obviated by simple implements like that shown in the engraving. We have illustrated the instrument as in actual use, with a portion cut away to show the main working parts. Externally it is a rectangular box the lower part inclined at one side at an angle. The upper portion, A, is a seed receptacle, the bottom of it being formed by the roller, B. This roller is insured a partial rotation as the slide, C, is raised or depressed by the hand, by means of straps secured at one end of the periphery of the roller and at the other to another parallel slide, D, which raises and falls with C. The roller has a depression or cell on its circumference which by the rotation of the roller is presented to the seed in the hopper when the slide, C, is depressed. By raising the slide the roller is turned in the opposite direction and the seed is thrown into the trough, E, and falls to the bottom, where it it held by the spring plate, F, until a downward movement of the plunger opens the plate and permits the seed to escape. A simple device of a friction brush bearing against the periphery of the roller, retains the seed in the sell until it arrives in the proper position to be dropped ; the strap, G, with a snug on the roller, determines the length of the reciprocating movement of the plunger, C.



BARBARIN'S METALIC COTTON-BALE FASTENER.

quality than the standard required by the board. Private and perfectly independent tests have likewise been made, and again the results have been adverse to the ruling of the Admiralty officials. Under these circumstances the firm more particularly concerned has intimated the intention of commencing legal proceedings against the Admiralty for the heavy loss they have sustained.-London Times.

400 SILL'S STAMP AFFIXER.

The engraving represents, in perspective and in section, a handy office implement intended to obviate the slow and disagreeable process of affixing stamps. Where the amount of



correspondence is large, or in an office which issues many documents to which stamps are necessary to give them validity, the work of affiixing them is not only laborious but very annoying The friction of the stamps on the tongue and lips induces sores, and the operation, after long exercise, becomes painful.





The Springfield Republican thus picks up the New York Tribune on its very scientific account of our recent snow storm :--- "The snow storm in New York must have been astounding. Its effect upon the intellects of the metropolitans may be inferred from the philosophical deduction of the Tribune, that 'immense forces, imperfectly explained on the hypothesis of an ever-shifting vacuum, dwell in the atmosphere, and we are continually surprised by their action.' Up here in the country we know that snow is only frozen vapor, and that when the wind blows it drifts, and we are not in the least astonished thereat. The 'ever-shifting vacuum' we suspect to be exclusively metropolitan."

Government Tests for Iron.

During the last few weeks considerable quantities of the plate iron sent into Chatham Dockyard by the contractors supplying that establishment have been rejected by the officials, on the ground of its alleged inferior quality and its failing to reach the standard of excellence insisted upon. The contractors have appealed to the Admiralty on the subject,



With this machine all this annovance is obviated. The stamps in slips are wound on the reel, A, and led under the ratchet wheel, B, and over a sponge, C, in the water reservoir, D. By pressure upon the handle, E, the affiixer, F, is thrown down and the pawl, G, is actuated against teeth on the wheel, B, rotating it and bringing forward the strip the length of a stamp. The affixer or platen, F, has a steel edge on its inner surface which acts against a fixed steel blade on the platform, the two forming shears for clipping off the stamp. ing of three separate pieces,

No further description appears to be necessary to insure a perfect understanding of the device. It is the subject of two patents obtained through the Scientific American Patent Agency, and dated March 9th, 1858, and Oct. 13th 1863, by H. F. Batcheller, Sterling, Ill., whom address for rights, etc.

A New Anchor.

An anchor weighing twenty-six hundred weight called Martin's self-canting anchor, was lately tested by the Admiralty trial near Newcastle, England, which, after sustaining the full Admiralty proof of twenty-five and five-eighths tons was further tested by an additional strain of fifty per cent, and exhibited no signs of permanent deflection. The anchor

is of peculiar shape and construction. Both arms, or flukes, take hold of the bottom and the steadying stock, set at a certain angle, and of a particular form, acts in conjunction with the arms and increases their hold to a great degree, especially on soft and yielding bottoms. As every usually projecting part is brought into action no portion really projects, so that fouling is almost, if not quite, impossible. Alongside the ship it cats as flat as a board. It is made without welds, be-

We give herewith engravings illustrating processes for carbonizing wood to be exposed to moisture and for disintegrating rock without the use of gunpowder. It was originally proposed by M. L'Apparent but perfected by M. Hugon. It is in use by the French Telegraphic Company, giving excellent results. We condense a discription from the London Mechanics Magazine translated from the Annales du Conservatoire Imperial. The invention consists in a movable and portable furnace and a reflector which is a curved plate, M, Fig. 1, from 12 to 16 inches diameter, mounted on a vertical shaft on the streets. This mill was then some distance beyond the limits tail piece, C, Fig. 1, of the bench, G, Fig. 2. By means of of the city, on the public road. this tail piece any timber placed upon it and exposed to the

of the posts or piece i timber are carbonized by means of the lever, N, Fig. 1, which turns the whole movable support with the plate, M, around the central point, **O.** Fig. 2, is a vertical section of the whole apparatus and Fig. 3, an elevation. A, is the furnace for coal with a door at the top for introducing the fuel; B, is a movable column supporting the furnace and allowing it to be raised and lowered by the lever, P Q, with the counterpoise, R, or moved horizontally around its axis. D, Fig. 2, is a double bellows injecting air below the furnace through the reservoir, D' and a flexible tube, d; E is a water reservoir; F is a cock for introducing water into the reservoir. D', and f a small pipe for injecting water upon the blast in k. A sleeper or other piece of timber is represented at H, exposed to the flame. The railway company at Vierzon, carbonize 288 sleepers daily with four mabhines, at a cost of less than one centime per stick.

Fig. 4 shows the application of this device to rock cutting. For this purpose the apparatus is mounted on wheels running on temporary rails c. In the engraving A is the furnace; B is the door for chargingit; H is the air blast pipe; F is a cock communicating with a reservoir to regulate the quantity to be injected into the air passage, and G. a valve to intercept the blast. The concern is so arranged that by a lever it can be inclined at any angle to direct the force of the flame upon any portion of the cutting. It takes only about 15 or 20 minutes after starting the fire before the flame blast is sufficiently strong to work effectively. The intense heat, thus generated by the acid of the air blast and the decomposition of the water, rapidly breaks and splinters the rock. The furnace is then removed and cold water thrown against the rock dislodging large quantities of the obdurate material.

It is said that in the hardest rock, as quartz, this apparatus can dislodge triple and quadruple the amount which gunpowder can. It is the application by improved devices of a principle known and used from

the earliest times by the most uncivilized of people.

A New Movement for Locomotive Throttles.

It is stated that an engineer of Greenfield, Mass., has invented a new movement to take the place of the common lever on throttle valves for locomotives. In this improvement the throttle is moved by right and left screws attached to a wheel from twelve to eighteen inches in diameter. The throttle valve cannot be moved unless the wheel is moved. and, in attaching the wheel, friction enough is produced by putting a large thumb screw through the yoke or frame so that the wheel will remain stationary at the ordinary pressure of the steam. Two of these valve movements have been applied on locomotives on the Hartford and Springfield Railway, and the engineers find them a great improvement on the lever arrangement.

From this brief statement, which is all we have to guide Lane, having two pair of stones. us in forming an opinion, we should suppose that the action of the device would not be rapid enough for all contingencies. CONVERSE'S IMPROVEMENT IN POCKET FIRE-ARMS. There are cases where the engineer needs to shut off his steam instantly, reverse his engines, and apply the steam Our engraving illustrates an admirable little improvement s when an obstruction is on the again t once, in pocket repeaters, the invention collision is to be avoided. Whirling a wheel, however rapidly, which actuates a screw, occupies time, and we think some quicker-acting device might be contrived which would be superior to the commonly used lever and at the same time obviate the supposed objections to this.

Carbonizing Wood and Blasting Rock with Fire. 1662, that there be another erected on the same ground, "out- little repeater is an elegant specimen of Yankee simplicity side of the city landport (gate) on the company's farm." "Old Wind Mill Lane," running from Broadway to Greenwich street, and between Cortlandt and Liberty street, upon which it probably stood, was, in Lyne's survey of New York, in 1729, the most northern street west of Broadway, all beyond being the King's farm.

Mills of this class were also built by private enterprise. Jan Teunizen had a wind mill in 1665, which was standing sixty years after, near the corner of Chatham and Duane

The bolting of flour, in those days, was usually carried on jet of the furnace has every part presented to the action of as a separate business, and in establishments constructed for the flame by the reflective powers of the plate, M. The ends that purpose, sometimes at a distance from the grinding mill

and mechanical skill. It is used with metallic cartridges, which are inserted at e.

The pistol can be loaded and fired with great rapidity, is simple to the last degree in construction, therefore durable and little liable to disorders. We have yet to see a fiveshooter which combines so many practical excellences in so small a space, and is sold for so low a price as this. The "Ladies' Companion" is a decided success and we think will have an extensive introduction. Patented Aug. 28, 1866. Manufactured by the Continental Fire-Arms Company, Nor wich, Conn., Charles A. Converse General Agent.

Chunks of Gold,

We copy from a California paper an Alladin-like statement,

F16.3 F1G.2 i Ci. I FIG.4

APPARATUS FOR CARBONIZING WOOD AND BLASTING ROCK.

and often as an appendage to the bakery. During the opera- | depths, than everbefore, and the confirmation of these statetion of an Act of the Assembly, made in 1684, giving to New York the exclusive right of bolting flour within the province, mills sprang rapidly into existence in the vicinity of the town, and the manufacture of flour became a principal source of emolument to the city. Two years after, under Governor Dungan, the city received a new charter, giving additional municipal privileges, and confirming the ancient Dutch franchises. A new seal, more rich and elaborate than the old one, was now granted the city, which, as indicative of the principal sources of its prosperity, retained the beaver to represent its ancient commercial interests, and added a wind mill and a flour barrel as emblems of its present industry.

A wind mill once stood on the hill in the rear of the old jail, or the present Hall of Records, and an eminence near the Chatham Theater was called "Wind Mill Hill." In 1760, John Burling advertised for sale a wind mill near Bowery

with comments, on the discovery of gold muggets. It says that the miners in the Woodside Quartz Mine near George- town were "blocking out a nearly pure, solid mass of gold three feet in length. If such a statement had come from a stranger, we should have received it with incredulity, but we can vouch for the sincerity and intelligence of the author of the message. The finding of gold in such large masses in a lode, is without a parallel in the history of mining. The metal in veins of auriferous quartz is usually in small particles, and pieces are very seldom obtained weighing more than a few ounces. Probably the largest piece of gold heretofore taken from any lode in this State did not weigh more than a pound. But our telegram mentions one lump, obtained in the Woodside Mine, weighing 100 pounds, and it is implied that the piece three feet long will weigh very much more. The large nuggets, however, which have been found in the placers, must have come from quartz veins. Australia produced one nugget weighing about 225 pounds; and in 1854 a lump of 160 pounds was obtained in Calaveras county ; and this State has produced a multitude of nuggets weighing ten or twenty pounds. All these must have come from quartz veins, and surprise has been expressed by several writers that the particles of the precious metal found in our lode mines are so small. If the accounts from the Woodside Mine should be verified, our largest mass of gold must hereafter be credited, not to placer deposits, but to quartz. It is worthy of note that the Sonora Democrat of the 3d inst., asserted that, in the previous week, some Italians had found a streak of gold four inches thick in a quartz mine in Deer Flat, Tuolumne county, and had to cut out the metal with cold chisels. This report was considered so improbable that it scarcely deserved repetition, but it may be true for all that. A number of the quartz mines of the State are vielding better now, at great

ments from Georgetown and Deer Flat would assist to give a new impulse to the branch of mining which must be the chief reliance of our gold miners in the future."

Snow in Cities.

It is curious to note how the same circumstances are viewed in different localities. The Engineer, London, says :--- "The large masses of snow at present lying in our streets impede the traffic to an enormous extent. Why do not the authorities adopt some measures to remove it? We have seen the scavengers, employed in clearing the street gutters, deliberately throw the snow they had removed into the middle of the street."

This complaint sounds queer to the dwellers hereabouts. In Boston, if not in this city, the "scavengers employed in clearing the street gutters," are employed for the very purpose of throwing the snow into the streets. That is just where we want it. Where else? Certainly if we clear our trottoirs and gutters for the passage of pedestrians and water, we can do no less than to give the results of our labors to our leds and cutters We want snow in our streets. It is easier

Wind Mills in New York City.

Minnit, the first Dutch governor, built, according to Moulton, "two or three wind mills at Manhattan, by which corn was ground and boards sawed." One of these, a flour mill, stood on a hill which occupied a part of the present Battery, so near the fort that the latter, which was rebuilt by Van Twiller, in 1633, intercepted the southeast wind, and rendered the mill nearly useless. But one of three wind mills previously erected was in operation in 1638, when Keift came to the government.

On one of their farms, of which they reserved several in different parts of the island, the West India Company erected andt streets. After having gone to decay, it was ordered, in the barrel it is only necessary to loosen the screw, d. This bly exceeds that of any other general newspaper in America.



of Norwich, Ct., which he has very appropriately christened the "Ladies' Companion." It is not much larger than a good sized knife, our cut being almost the actual size of the article. The improvement consists in the use of a short pivot, b, upon which the rear of the barrel, a, turns, and in the use of a ring, a "Wint molen" (wind mill) for the use of the town. It |c, which clasps the barrel, and while permitting it freely to restood near Broadway, between the present Liberty and Cort. volve, secures it firmly to the stock of the pistol. To remove

for horses, more comfortable for men, and profitable to owners of sleigh teams to let.

Cost of a Newspaper.

Some idea of the vast expense attending the publication of a first-class daily paper may be inferred from the annual statement made by the New York Tribune Association.

The gross receipts from subscriptions, sales, and advertising, in 1866, amounted to \$909,417. The expenses were \$885,158, showing a net profit of but \$24,259 to be divided among the stockholders.

ITEMS:-The printing paper cost \$418,199. Pressmen and Compositors, \$133,000. Editorial expenses, \$81,775. Correspondence, \$49,300. News by Telegraph, \$58,776. Mailing, counting, and packing papers, \$35,000. Taxes on advertising, \$10,082, besides many other expenses of less magnitude, but which help to eat up the profits of the publishers. In 1865 the receipts were \$816,537, expenditures \$646,107, showing a profit of \$170,430. The combined circulation of the various editions of the Tribune, daily, weekly, and semi-weekly, probaThe Editors are not responsible for the opinions expressed by their correspondents.

Earth Worms---How and What they Eat.

MESSRS. EDITORS:—I see that you have published an article about the habits of earth worms, which useful little creatures seem to be much underrated. They may eat earth, as your author asserts, but I have never seen them do it, although I have seen them eat other things with great voracity, and have also seen them reject particles of earth which adhered to their proper food, such as dead spears of grass, roots and leaves.

I have watched them feeding for hoursat a time, and retain a lively recollection of several rheumatic attacks, resulting from the wetting I got while so watching them. They feed at the surface only when the withered vegetation is wet with rain or dew and is in a soft and pliable state. When their food found at the surface is dry, and too harsh for their mouths to manage, they retire to the congenial depths of the ground, delighting in heaps of "long" manure, which they reduce to a homogeneous mass of compost with great rapidity by consuming the vegetable and undigested parts thereof, thus transforming the matter from a vegetable to an animal character, leaving the mass at its lowest chemical status and so fit for the food of plants. Indeed I doubt if any atoms of vegetation can decay and be again fit food for other vegetable organisms without an intervening decomposition in animal digestive apparatus. At all events, it is easy to prove that earth worms are the compost makers, and if we do not give them time to properly manufacture their " product " while the manure is in the compost heap, they will appear in the fields and then complete the job, and further, their work in fields yields another benefit by their boring and opening of the soil.

Their manner of eating is worth noticing. If you seat your self upon a grass plat or beside the strawberry bed, during a light rain in warm weather, and have the patience to sit perfectly still for ten or fifteen minutes, you will see innumerable worm heads protruding cautiously from the ground, and feeling around until a spear of soft and recently killed grass is found. The worm touches it first with the extreme point of the head, and then the point retracts inward, much like the toe of a stocking when you touch it with your finger to commence turning it : then the worm [shortens its length, the other end being fast anchored in the hole: this action makes a bight in the spear of grass, and then the worm crawls along the outside of his supper until the parts diverge too much, when he takes another pull, and so on until the grass is loosened from its own roots and safely swallowed. I have observed that if a particle of earth adhere to the food it is shoved along as the swallowing progresses, and not allowed to enter the mouth. The final act of swallowing the end, and biting off the lump of root which is sometimes attached, I have never seen, as that is performed within the hole : but I have frequently seen the worm re-appear with a pellet of earth balanced upon his head, or it may be only the piece of root if his supper was clean, which he deposits at the surface beside his hole, when he prowls around for more food while it is good.

When two worms seize oppesite ends of the same spear, the pulling and hauling is most comical, reminding one strongly of his early days when he strung grains of corn upon opposite ends of a string and fed two rival gobblers. The worm fight generally ends by the breakage of the grass, but if too strong for their strength they both swallow until their heads touch each other, when they both "get," leaving the morsel, which they will not touch again. I have often seen these worms breaking off the dead parts of strawberry leaves, rejecting the living parts, and have also seen them apparently sucking the pollen from strawberry flowers. In the fall large tufts of dead leaves may be seen drawn partially within the worm holes, possibly by way of stoppers to keep out the cold.

Science Lamiliarly Illustrated.

Why Water Presses Sideways and Upward.

"Truth is stranger than fiction." The young philosopher is surrounded with mysteries and is called upon to accept as fact what seems to him incredible. Many of the fundamental truths of natural science are apparently inconsistent with his everyday experience and observation. It certainly is not all stupidity which makes the boy slow to learn that the earth is round, that the sun is bigger than the earth, and that the air has a weight which squeezes up his body with a force of five or six tuns. It is probably the case that the children who do learn these things, are helped on more by their natural credulity than by conviction of the judgement. And there are many grown up people who remember only the outline of facts taught them in childhood, and have never troubled themselves for reasons about them. How many skillful mechanics can give good orthodox scientific reasons for the fact that water presses sideways and upward as well as downward? Bodies which make a pressure in consequence of their weight generally press downward only, and this pressure is exactly proportioned to the weight. In fact the pressure and weight in our common experience are the same thing, and upon this conception of the case our balances and other weighing machines are constructed. The weight is due to the force of gravity which pulls in no other direction than downwards, or towards the center of the earth. Then why can there be any movement sideways or upwards?

will be only downward, and there is no tendency in any other direction. But if we try to pile up sand in the form of a column we know it spreads out at the bottom, and thus in this case there is a tendency or pressure sideways. The reason of this can be made very clear by observing what takes place when a few grains only of sand are experimented with. Sand, however, is composed of little rounded pebbles, and it is better for the experiment to take large pebbles or bullets, as they can be better seen. Place two pebbles side by side, and then a third over and between them. The result is that the two are spread apart and the third falls between them; the third pebble has acted like a wedge to divide and push them laterally. Now what takes place in our experiment may by careful observation be observed in heaping a large body of sand.

Take a tube shaped like the letter L and pour in sand at the top and soon it runs out at the side and with a good deal of force. If the tube be shaped like the letter U, and the sand be poured in at one end it will rise up in the other. In these simple experiments we have plain illustrations of lateral and upward pressure. But it will be observed that the sand loses force in moving and that it will not go very far in the horizontal part of the L tube nor rise very high in the U tube. The reason is simply that the particles of sand are rough and the friction stops the motion; our sand needs to have a lubricator. The particles of water seem to be very smooth and slippery, so that none of the lateral and upward pressure is lostdy friction, and the sideways and upward pressure at any given point are equal to the downward.

Machines Mediums and not Reservoirs of Power.

One notable fault with most young mechanics is the belief that machinery is a source of power—that mechanical appliances not merely transmit the force first exerted, but increase its power. In fact, this belief is shared sometimes by those of experience enough to know better, and is the source of the enormous waste of ingenuity and mechanical ability shown in the attempts at mechanical impossibilities and especially in the never-ending experiments for the discovery of a perpetual motion.

Mechanical appliances increase our ability to move objects, but so far as they do this they compel a loss in velocity. For instance: By the use of a lever a man may lift a rock which unaided by this simple means he would be unable to move, but if he could lift it without this aid he could move it much more rapidly. The lever is one of the most powerful of the simple mechanical powers. Archimides was not a senseless boaster when he said: "Give me a fulcrum for my lever and I will move the world." Its value may be seen in the common steelyard where a poise of one pound on the extremity of the bar will counterbalance one of a hundred at the end of the shorter arm. The safety valve lever is an example being what is called a lever of the second class, the weight being between the fulcrum and the power. In this device a weight of a few pounds or a spiral spring counterbalances the pressure or weight of hundreds of tuns.

The pulley and the gear, although not often classed as related to the lever, may be considered as modifications of the same mechanical power. The pulley may be called a double lever, having a common fulcrum in the shaft. So the gear acting by its cogs or teeth on another gear may be considered a lever. None of these are motors or originators of power but only conveniences for its transmission. Indeed they do not transmit all the power which they receive, as friction of the parts absorb or divert a certain percentage of it.

The inclined plane is commonly classed among the rudi mentary mechanical powers, but this is hardly correct unless we make a double incline, as the wedge, or a spiral incline, as the screw. In fact the lever is at the root of all mechanical powers, and all others partake, more or less of its nature.

STEEL-HEADED RAILS.

WE published in No. 4, present volume, diagrams of a new steel-headed rail for roads and of the pile from which it was forged. Rails with steel faces have been used, the steel being simply a plate welded on the top of the iron. They did not prove very successful from the difficulty of making a perfect union of the two metals, and from the fact that the inside lip of the wheel abraded the iron, contributing to a more rapid deterioration. Since publishing the description of the improved steel-headed rail we have seen cross sections of them which show a perfect weld between the iron and steel, which we are informed by Mr. S. L. Potter, the Superintendent of the Wyandotte Mills, at Wyandotte, Mich., is obtained without the use of a flux and the result is secured by the pe cular method of making the pile for heating. These rails are steel, not on the upper face alone, but on the sides sufficiently to take the wear of the wheel lips. They are used on several of the western railroads and give perfect satisfactfon. As they cost at the present price of steel only about forty per cent more than iron rails and much less than rails made wholly of Bessemer steel, they seem well adapted to supersede the ordinary rails whenever they are removed. Railroad men who are interested in the subject of steel rails would do well to corre spond with Mr. Potter, at the Wyandotte Mil's, as above, where the rails are at present manufactured.

Becent American and Loreign Batents.

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

EXPLOSIVE COMPOUND.—H. A. Bleckmann, London.—Dated May 10, 1866.— This improved composition is composed of the following ingredients: Sawdust or other particles of wood, or other cellulose substance in a finely reduced or comminuted condition; saltpeter, or nitrate of potassa, and charcoal or carbon, and sometimes ferro-cyanate of potassium. These materials, that is to say, the sawdust or other cellulose substance, the saltpeter or nitrate of potassa and charcoal, with or without the ferro-cyanate of potassium, form or constitute, when mixed together, a compound or agent which will not explode by impact, ramming, or friction, but only by ignition or the application of fire, or very strong heat.

TREATING AND APPLYING A CERTAIN VEGETABLE PLANT FOR THE PUR-POSES OF THE TOBACCO PLANT.—F. C. Buisson, Natiat, France.—Dated April 21,1863.—This invention consists in treating the leaves of the tuberoussunflower or Jerusalem artichoke (*helianthus tuberosus*), and applying them to the purposes for which the leaves of the tobacco plant have been employed. The patentee collects the leaves of the tuberous sunflower, dries them, and submits them to the operations to which the leaves of the tobacco plant are ordinarily submitted in order to manafacture therefrom a tobacco for smoking—cigars, rolls, cakes, snuff, or other usual forms. The smoke arising from the tuberous sunflower leaves, when thus heated, is odorous, sweet, and slightly acidulous; it is not acrid, and has no poisonous effect.

DIRECTOR.-W. G. Grant, Wakeman, Ohio.-This invention relates to a director for inserting a sponge or other similar or suitable pessary into the vagina, to act as a support to the mouth and neck of the uterus, in cases of female weakness.

CHEMICAL PROCESS.—René Cupper, New York City.—This invention relates to a process for the extraction of iodine from sea water, which is accomplished by precipitation.

CHIMNEY TOP OR CAP.-W. F. G. Beeuwkes, Holland, Mich.-This invention relates to a top or cap for chimneys. The principal object of this invention is to prevent the roof of the building through which the chimney extends, from becoming heated by the action of the heated currents of air and products of combustion passing through the chimney.

COPY HOLDER. — Charles B. Moseley, and Lucius L. Woolley, Medford, Mass.—This copy-holder is specially intended for the use of compositors, although it can be readily and easily adapted for use by various persons such as copyists of legal and other papers, proof-readers, etc.

SAW SET.-W. A. Alexander, Mobile, Ala.—This invention relates to an improved device for setting saw teeth, and consists of a clamp formed in two parts, one of which parts contains a recess for receiving the saw tooth when it is bent as desired, by means of a lever in the other part, the extent of the deflection of the tooth being regulated by a set screw in the recess, which limits it as desired.

VISE.—James S. Ralston, Indiana, Pa.—This invention relates to an improved plan of construction of a vise for blacksmiths, carpenters, or other mechanics, and consists in an arrangement for opening and closing the jaws of the vise by means of two eccentrics or cam disks placed outside of the jaws on a connecting and operating rod.

TOOL FOR CUTTING BOILER TUBES.—Richard H. Burke, New York City.— This invention relates to a tool which is intended to cut off boiler tubes inside the tubes heet, but which may also be used for cutting off the ends of such tubes. It consists of a pipe which contains a conical head provided with slots to retain the cutters, and with a feed screw in such a manner that by the action of the feed screw and conical head the cutter can be gradually fed out as the operation of cutting progresses, and boiler tubes of any desired thickness can be cut with the greatest ease and facility. The pipe, which contains the conical head and the cutters, is provided with a series of sleeves in such a manner that said pipe can be adapted to boiler tubes of different diameters.

COOLER FOR COFFEE AND OTHER ARTICLES.—Jabez Burns, New York City.—This invention consists in an appairatus for cooling coffee as the same is discharged from the roaster, or other articles of a similar nature, by a downward draft produced by a suction blower or other suitable apparatus in such a manner that the smoke and dust which generally rise from the coffee or other article to be cooled, are prevented from filling the room, and all inconvenience and danger of fire arising from that source are avoided.

ROOF FOR RAILROAD CARS.—John Stephenson, New York City.—This invention relates to the construction of the roofs of horse or street cars, and has for its object durability, a greater convenience than hitherto in shipping cars of this class, and a greater facility and economy in repairing the roof.

PEAT CAR.—Thomas J. Wells, St. Anthony, Minn.—This invention relates to a new car fortransporting peat blocks or bricks from the machine or place where they are prepared to the drying house, where they remain until they become sufficiently dry for fuel. Also, in a novel construction of the car, whereby one person is enabled to load and unload the car, with the greatest facility.

COMPOSITION FOR COATING OR COVERING SHIPS' BOTTOMS.--R. Hamilton St. Helen's Place, London.--Dated April 19, 1866.--This composition is composed of fifty pounds of tallow, thirty pounds of white arsenic, and ten pounds of mercurial ointment.

TREATING INDIA RUBBER—S. Bourne, Harrow, Eng.—Dated May 3, 1866.—This invention consists in heating india-rubber and India-rubber compounds in the presence of charcoal, by preference animal charcoal, whereby all unpleasant odor is removed from the india-rubber.

COMPOSITION FOR REMOVING AND PREVENTING INCRUSTATION IN STEAM BOILERS.-G. Feasey, Camberwell, Eng.-Dated May 2, 1866.-This improved preparation or composition for removing and preventing incrustation steam bollers is composed, mainly, of carbonate of soda and co on salt, with a small quantity of borax, and sometimes sal ammoniae or hydrochlor ite of ammonia mixed with soap, a small quantity being added from time time, to the water in the boiler.

COMBINED CORSET AND SKIRT SUPPORTER.—Wm. Bacheller, Boston, Mass. —This invention relates to a skirt supporter and corset combined, the said supporter being made of sheet metal or other suitable material molded to fit the form of the person wearing it, and so secured to the corset as to form a part of the same and to be susceptible of being attached and detached at

If a lot of bricks be piled on top of each other the pressure wa

THE proportion of ammonia contained in rain water is liable to considerable variation. In one million parts of rain water collected in Paris during the last five months of 1851, Barral found 3.49 parts; Boussingault, at Liebfraunberg, in 1852, found only 0.744 parts; Lawes and Gilbert, at Rothamstead, in 1853 and 1854, found the average amount from March to August to be 1.42; from September to February 0.927 parts, or about one grain of ammonia in fourteen gallons of water.

pleasure when the corset is to be washed or cleansed.

GLOBE VALVE.-C. L. Frink, Rockville, Conn.-This invention consists in forming a peculiar-shaped disk by which a person is enabled to hold the elastic packing in globe or other valves in place.

CULTIVATOR.—C. P. Norton, Roseville, Ill.—This invention relates to the construction and arrangement of the several parts of a corn cultivator whereby an efficient and very simple machine is produced.

LIFE-BOAT.—William Henry Wylly, Savannah, Ga.—The object of this invention is to provide a life-boat which shall not only combine lightness, strength and durability with safety, but be so constructed that it can pe easily transported from place to place overland or on shipboard.

PUMP.-J. G. Weisinger, Danville, Ky.-This invention consists in so constructing and arranging the various parts composing the pump as to secure continuous suction and thus discharge therefrom in a continuous stream.

FAN BLOWER.--George W. Bright, Philadelphia, Pa.-The object of this invention is to obtain a blast by the reaction of steam or other elastic substance discharged from the wings of the blower thereby causing them to revolve with great rap.dity.

PLANT TRAY.-Dr. William W. Smith, Montrose, Pa.-This invention consists in forming a box or tray for the propagation or growth and cultivation of plants and flowers either for outdoor or indoor use.

GOLD CONDENSER.—William G. Redman, Louisville, Ky.—This invention consists in constructing an instrument for condensing gold in the process of filling teeth, and for preparing the cavity for filling, whereby the operation is much more perfectly performed than by the old method.

DEVICE FOR NDING RAILROAD CAR WHEELS ON OR OFF THE TRACK George T. Lape and Jephthah Leathe, New York City .- This invention relates to a device to be used for guiding railroad cars on or off the track, the f orm being modified to adaptit to the rail either of a street horse-car railroad, or of a railroad for steam cars.

WASHING MACHINE.-Chorles Daniel, Lamonte, Mo.-This invention consists principally in a slotted cylinder, adjustably pivoted to the sides of the tub or box, in combination with a slotted adjustable concave frame, pivoted to the sides of the box or tub, by means of which the clothes are held forward to be washed by the revolution of said cylinder.

FILTERING TUBULAR WELLS .- Charles C. Cole, Northfield, Vt .- This in vention relates to the construction of lower sections of tubing, to be used for obtaining water cheaply and readily in clay or sandy regions without the expense and trouble of digging wells.

TETHER.-Daniel Kidder, Franklin, N. H.-The object sought to be at tained by this invention is to provide a tether by the use of which it will be impossible for the rope or chain employed, and by which the animal is har ed or connected with the tether, to become entangled with or about the limbs of such animal.

CANE STRIPPER.-Amos Bean, Canaanville, Ohio.-This invention has for its object to furnish an improved instrument by means of which cane may be stripped quickly and cleanly.

STEAMBOAT SIGNAL BELL .- Patrick Kenny, New York City .- This inven tion has for its object to furnish an improved apparatus, by means of which the pilot from the pilot house may readily and unmistakably communicate his directions to the engineer.

WINDOW BLIND FASTENER.-L. C. Wing, Concord, Mass., and A. R. Brad een. Waterborough, Me .- This invention has for its object to furnish an improved means by which window blinds may be held and locked both when closed and when opened to any desired angle.

SCAFFOLD.-L. B. Carpenter, Milwaukee, Wis.-This invention has for its object to furnish an improved scaffold for masons' and bricklayers' use, by means of which they can raise themselves as their work advances to any desired height, without its being necessary for them to unload the scaffold and build it higher.

PUMP.-John Ross, Greenville, Mich.-This invention has for its object to iurnish an improved pump, by means of which water can be raised from deep wells quicker and easier than with the pumps now in use.

OPENING AND CLEANING COTTON, ETC.-Samuel Fay, Lowell, Mass.-This invention is designed to furnish an improved machine for opening and clean ing cotton and other fibrous substances in a thorough manner, without in juring the fiber or rolling or curling it, as is the case when opened by ordinary means.

COTTON CHOPPER AND THINNER.-David P. Lewis, Huntsville, Ala. —Thi invention relates more particularly to the cultivation of cotton, but is adapted to other crops, and it consists in operating a double-bladed hoe by machinery.

COVERING COT OR ROLLS .- Edward Livingston Perry, New York City .- This invention consists in forming a cot or covering for the rolls of spinning and other machines, of three or more separate layers or thicknesses of material. secured or united together, by means of cement, glue, or other suitable adhesive material, or in any other proper manner, either independent of the roll on which the cot is to be used, or directly upon the same.

CUTTING FILES .- Charles Vogel, New York City .- This invention consist in an improved arrangement of mechanism for feeding the file bloks to the cutter, whereby the speed of the file may be varied according to the size of tooth required. Also, in an inproved file-bed, so constructed that files of varying sizes can be secured to it; and also, in a novel manner of hanging the cutting-tool, whereby it can be adjusted to suit the desired direction or angle of inclination of tooth with reference to the length of the file block.

BROOM.-Hy. E. Newton, Manchester, N. H.-This invention consists in at taching one or more springs to the broom head, and securing their upper ends to the handle, in such a manner that they form the connection between the handle and the broom head.

PLOW.-Israel Long, Terre Haute, Ind.-In this implement, which is a whe or sulky plowing machine, a plow is attached to either end of the axle outside of the wheels by means of adjustable arms or beams, one plowbcing raised ou of contact with the ground while the other is in operation. The working plow stands in close proximity to the wheel on that side of the machine, and prevents clogging by uprooting and deflecting the weeds, stones, etc.

MILL GOVERNOB.-William Bahme, New Media, Pa.-This device is intende to close the water gate and stop the water wheel when a certain speed is at When the grain ceases to feed between the mill stones the rapid revo tained. lution of the runner frequently fires the woodwork. To avoid this a revolving governor ball is pivoted by an arm to the mill shaft, so as by the rise due to a high rate of speed to strike a plate and release the water gate which controls the admission of water to the wheel.

GANG PLOW .-- J. H. Doutbit, Albany, Oregon.-This invention relates to a gang plow, and consists in a novel construction and arrangement of parts whereby the operator has full or perfect control over the plows.

CAMP COFFEE POT AND BOILER .- Luke Plumb, Biddeford, Maine.- This in vention relates to the combination of a camp tea or coffee pot and boiler, or pitcher, whereby an ordinary coal-oil lamp may be rendered serviceable as a heater for cooking in a small way; such, for instance, as the making of coffee and tea, warming water, and keeping a meal warm during the delay or tem porary absence of a person from the table.

SEED PLANTING MACHINE .- D. S. Holman, Conneautville, Pa .- This inven tion relate: to a machine for planting seed, and it consists in a novel seed dropping device, with means for regulating the discharge of the seed, and also in an improved means for opening the furrows and covering the seed after being dropped therein.

HOOP-SKIRT HOLDER.-EmileLoiseau. New York City.-This invention con sists in arranging a device whereby the lower or any one hoop of the skirt is secured to the petticoat, thereby making actually one garment out of the two.

COMBUSTIBLE AND INEXTINGUISHABLE COMPOUND .--- J. Sharp and R. Smith Blackford, Perthshire.-This invention relates to the combination or mixture of certain materials for the production of a combustible compound which when once ignited, becomes inextinguishable by any agent at present known as it burns without atmospheric air, and will burn in water, in carbonic acid gas, nitrogen, and all other gases which do not support combustion. Under one modification the compound may be formed by mixing nitre, charcoal, and sulphur, all in a powdered state, and then adding and thoroughly com-

STRUCTURES, ON CANALS, RIVERS, ETC.-C. E. Brooman, London.-This invention consists in constructing a continuous rail or bar, or its equivalent along the side of the canal or navigable water, which rail or bar is grasped by traction or friction wheels operated by steam or other power in the boat to be removed. It is attached by any convenient means to upright posts firmly fixed and ranging along the direction of the canal.

SAFETY RECORD PAPER.-L. M. Crane, Ballston, N. Y.-This invention re lates to a safety record paper for bills, deeds, currency bonds and other in struments or documents which are liable to be forged or fraudulently altered This invention consists in inserting in the paper pulp and incorporating with it, during the process of manufacturing the paper, one or more threads on strips of guttapercha or other material which will soften under the heat of the drying cylinders of the paper-making machine, and become inseparably united with the paper so as to be incapable of being removed or detached without destroying the latter.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters, must, in all cases, sign their names. We have a right to know those who seek in formation from us : besides, as sometimes kappens, we may prefer to ad dress the correspondent by mail.

SPECIAL NOTE—This column is designed for the general interest and in-struction of our readers, not for gratuitous replies to questions a purely business or personal nature. We will publisk such inquiries, however, when paid for as advertisements at 50 cents a line, under the nead of "Business and Personal."

R. L. B., of Mass.-The alloys of magnesium reported on at the present time are all brittle, and are generally more easily oxydized than magnesium alone. But we hope you will continue your experiments and let us hear from you when you shall have produced a useful alloy.

J. C. M. & Co., of Pa.—The oxygen of the air can readily be removed by phosphorus. But in that way you dispose of only one-fifth of the whole. There is no substance that will take up the nitrogen. We think therefore you will not be able to secure a good vacuum on the absorption plan.

H. S. C., of Pa.—The coloring matter of clay is generally iron or organic matter. On baking clay, the organic matter is burned up, and if the clay contained no iron or other metal, the ware will be white. The iron may be removed by soaking the clay in hydrochloric acid. The ordinary blue clay gets most of its color from organic matter. The red color of bricks is due to an oxide of iron.

W. E. B., of Pa.—You will find in the text books on chem istry reliable tables of the expansion of metals by heat. Of the metals you name. zinc expands the most.

J. C., of Tenn., quotes from Hooper's Medical Dictionary article Caloric, some contradictory statements regarding the density of melted and solid iron. When the doctors seem so disinclined to agree or matters touching their own art, it is not surprising that they should be in consistent on outside matters

C. A. G., of N. Y.—The tarnish on silver ware is most often due to sulphur. A gentleman, who wears a silver watch finds that it is tarnished from the sulphur fumes of the rubber ring which holds together his ferry tickets. Sulphur fames enough get into the air to account for all ordinary cases of tarnishing. The sulphide of silver is black.

G D. C., of Conn.-Wheels of lead, or rather a mixture of lead and tin, will carry flour of emery or crocus and will not deface the corners of an object and will give a perfect polish.

J H. P., of Mass.—There is necessarily nothing in the matter on postage or other Government stamps, or on envelopes, to induce sore on the lips. When they occur, as in the case of preparing replies to numer ous correspondents, the soreness is to be attributed to the iriction or tongue and lips which is much increased by the adhering quality of the

T. H. K., of N. Y.-You say that attached to your water wheel is a four-feet bevel gear, driving a sixteen-inch bevel gear, on a shaft carrying a thirty-six inch driving pulley with fifteen inch belt, and as whether more power can be obtained by the use of larger gears. Judging from the size of the belt used to transmit your power we think your gear are full small. Really no more power is developed by large than by small gears, but as bevel gears are at best but mechanical makeshifts, absorbing power, we think the nearer the two wheels approach in size the better they work. Better use bevel gears of equal size and speed upon your pulleys This statement is a reply to both your questions

H. B. L., of Ind.-A boiler begins to make steam as soon as the water begins to heat, and makes steam as long as the heat is applied, under all circumstances. The steam pressure in a boiler to the square inch is as great in the water space as in the steam space with the addition of he weight of water. Water does not, in our belief, present a barrier of wall to the pressure of steam. You are mistaken in saying that steam will not go down through water. Steam exists in water, and if you will care fully study "Heat and Steam by Charles Wye Williams," H. C. Baird, Publisher, 406 Walnut street, Philadelphia, you will probably modify your present opinions.

H. N. G., of Pa.-Turning tools for iron will cut better if ground on the side of the stone running toward you Never grind a tool the temper and edge of which you wish to preserve, on a dry stone. It is a certain and effectual method of drawing the temper of hardened steel.

R. O. N., of Mich.-A large part of the saltpeter (nitrate of potash) now used is an artificial product. Gun powder makers at first had a prejudice against saltpeter made from nitrate of soda, but there is no way of distinguishing the artificial from the natural product.

S. N. M., of Va.-Magnesia is an essential element in hydraulic cements. Any magnesian limestone, will give on burning, hydraulic lime.

R. D., of N. H.-Coal is found in several localities in New England, and has been mined in Rhode Island. But there is not enough coal in New England to affect the fuel question.

S. N., of Wis.—Copper is smelted on a tolerably large scale in this vicinity. The largest copper smelting works however, are located in Baltimore.

P. B., of O.-The reason that pickles, apple sauce etc. made in

DRAWING OF PROPELLING BOATS, BARGES, RAFTS, AND OTHER SIMILAR B. F. C., of Pa.-The question asked is this : If a cylindrical boiler of 3 feet diameter and 18 feet long has an extension attached, the inside dimensions of which are 18 inches long, 6 wide, and 1-64 high will the pressure to the square inch of surface to this contracted appendage equal that to the square inch on the boiler? We answer: The pressure will be the same, whatever the form and dimensions of the vessel, the only difficulty being to preserve the same temperature in the thin projection from the boiler as in the boiler itself. A thin film of steam at any noted pressure will exert the same force as a thicker stratum of one or more inches in depth

G. W. J., of R. I.—There is no necessity of cutting large holes through your floors, or of cutting holes at random to lead belts from a shaft on one floor to one on another. The mechanic who resorts to such means is a bungler. The whole plan can be laid out full size on an unoccupied floor, or by a scale on a sheet of paper or a board. As an instance, if you wish to lead a belt through two floors, measure the distance of the center of the shaft carrying the driver from the first floor, taking the diam eter of the pulley. Draw a line on the floor, sheet, or board representing the floor, and giving its thickness, with the diameter and position of the pulley. Then measure from the upper surface of the first floor to the ceilof the next, making another line; then from the next floor or top of the ceiling-allowing for thickness between them-to center of driven shaft, giving the diameter of driven pulley. Draw lines from periphery of driver to driven, and where these intersect the floor lines, are the passages to be cut

J. R. M., of Ohio.-You need have no fears on the point you suggest. We shall publish all that we think will afford interest and instruction to our readers. The society to which you referred, needed a strong hint. It will do the members no harm.

Sundry Answers :- E. K. C .- Mercury and oil are good examples.-J. B. C.-The royalty paid to the owner of a patent is always a subject of negotiation. The patentee has the right to fix the price so high that it amounts to a prohibition if he chooses. But we never heard of one who was such a fool as to do that. It is a matter of interest as well as of pride with a patentee, to have his invention used as extensively as possible. -C. H. M.-The best way is to advertise for an agent.-E. N.-In the back pages of the SCIENTIFIC AMERICAN, you will find information about dummy engines.—J. M. C.—Your perpetual motion will prove to be a per petual stand-still.—C. A. S.—The screw jack simply enables a man to apply his strength to good advantage, but it does not increase his strength It is impossible for you to obtain any more power from your screw arrange-You would get a partial vacuum in the way you describe, but it is a roundabout way to do it. The part by which you obtain the vacuum namely, the air piston and cylinder, are shown in all natural philosophies. C. R. S.-Cannot find the address without search.

Business and Personal.

The charge for insertion under this head is 50 cents a line.

J. C. Haines, whose Patent Bridle was illustrated in No. 3, present Vol., wishes parties to address him hereafter at Lancaster, Pa., in stead of Lewistown.

Reiner Brothers, Line Lexington, Pa., want manufacturers of cultivator hoes, also of tub and bucket machinery, to forward their address and price list

Γο Agricultural Implement Makers.—Send catalogues to W. A. O. D., Box 6810, Post-office, New York.

Wanted, a situation as foreman and superintendent of an Agriculture Tool and Machine Factory, by a first-class mechanic who has experience and good references. Address E. Peek, Chicago, Ill,

Watchmakers wishing cuts and circulars of Lakin's Lathe Tool will please address J. A. Lakin, Thompsonville, Conn.

C. G. Van Pappelendam, Charleston, Lee County, Iowa; wants a shop right to manufacture molasses out of corn. ----

NEW PUBLICATIONS.

The progress of the beautiful art of photography in this country, is in. dicated to some extent by the variety of books and other publications pertain. ing to the subject, which find a ready and extensive sale. From the publishing house of J. H. Ladd, 600 Broadway, we have lately received the following:

HUMPHREY'S JOURNAL FOR 1866. Semi-monthly, at \$3 a year.

A fine volume of 400 pages, brim full of the latest and best things concerning photography that have been recorded during the past year. The journal is highly valued for the many original contributions by its experienced editor and home correspondents, and for its foreign reports.

THE SILVER SUNBEAM. 440 pages. Price \$2 50.

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PHIC ALMANACEOR 1867. Edited AMERICAN PHOTOGR

mingling therewith a quantity of unground or unpowdered gunpowder. The proportions are four parts nitre, two parts charcoal, and one part sulphur, with the addition of two parts gunpowder.

PULLING FLAX.-John Harrington, Minomonie, Wis.-This invention relates to a machine for pulling standing flax for the purpose of harvesting the same, and it consists in the employment or use of a reel provided with clamps and arranged in such a manner that it will rotate as the machine is drawn along and grasp the flax, draw it out of the earth and deposit it upon the platform.

CAR TRUCK .- J. W. Reynolds, Hyde Park, Pa.-This invention relates to a mode of attaching or applying the pivot or king-bolt to the truck, whereby said bolt may be readily applied to and detached from the truck and a new one applied at any time, when necessary, with the greatest facility. This in vention also relates to a novel manner of applying the springs to the truck. and in an improved arrangement of the boxes.

APPARATUS FOR HEATING HOUSES AND APARTMENTS .- G. Davies, London.-The object of this invention is to utilize all the heat eliminated from the flame of gas, or that of any of the oils or fluids possessing illuminating properties, by causing such flame to pass over or come in contact with a system of heat-radiating materials, so arranged as to absorb, conduct, and radiate the heat imparted to the said radiating material from the burning gases or fluids, The smoke or vitiated air from the burning gases or fluids are conducted of in a separate pipe to the chimney or other place of exit, and pure heated air is conducted into the apartment when a heating apparatus is used, or radiated within the various compartments of a cooking stove or range when the latter used.

an iron kettle look dirty and black, is that some of the iron is dissolved by the acid, and this with a little tannin contained in the fruit, produces a black substance which is the same as ordinary ink. Acid fruits should be cooked in a porcelain lined kettle.

B. B. R., of Mo.-Lithographic stone is worth about 50 cents per 1b. If you send your sample to any practical lithographer he can give you a reliable opinion of its value. But be prepared to find out that you hav been mistaken, and that your article is not the genuine thing.

N. S. of Cal.-The best solvent of gold is aqua regia (nitric acid 1 part, hydrochloric acid 3 parts). There are also many other solvents

S. L., of N. Y.-The expansion by heat is generally understood by gas and steam fitters. You should observe that steam pipes for warming buildings are arranged so that no harm can come from the expansion

M. B., of Del.-Leather is chemically a compound of gelatine and tannin. Your article, which you say contains no gelatine, is not leather, We trust, however, you have something better than leather. You say that whenever you hear a fiddle you think of poor pussy cat. But you are misplacing your sympathy. Sheep and calves furnish us with catgut B. R., of Pa.-. The fact that stretched rubber on contracting becomes cold is not new. You will find it mentioned in Grove's Correlation of the Physical Forces.

R. V., of Ind.-Sorgho sugar cannot be distinguished from or dinary sugar when thoroughly purified,

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A record of the most valuable improvements, processes and formulas made during the past year. The almanacs for 1865, 1866, and 1867, are all in print, THE MAGIC PHOTOGRAPH, 25 cents, the PORCELAIN PICTURE, with full in. structions, \$1 00, and DRY PLATE PHOTOGRAPHY, OR THE TANNIN PROCESS \$1 00, all by Prof. Towlor, are highly useful.



Inventions Patented in England by Americans. [Condensed from the "Journal of the Commissioners of Patents."] PROVISIONAL PROTECTION FOR SIX MONTHS. 3,203.—PROCESS AND FURNACE OR APPARATUS FOR THE MANUFACTURE OF STEEL OR METAL HAVING SOME OF THE PROPERTIES OF STEEL,—Thomas J. Chubb, Brooklyn, N. Y. Dec. 5, 1866.

APPARATUS FOR SEPARATING SUBSTANCES OF DIFFERENT SPECIFIC TES.-Thomas J. Chubb, Brooklyn, N. Y. Dec. 5, 1866. 3,205.—AP Gravities

3,217.-LOOMS AND SHUTTLES FOR WEAVING.-Benjamin Oldfield and Edward Oldfield, Newark, N. J. Dec. 6, 1866.

3.246.—Sewing MacHinery.—Frank Armstrong, Waterbury, Conn. Dec. 8,1866.

5, 1000. 3,253.—BREECH-LOADING FIREARM AND CARTRIDGES AND BULLETS FOR THE SAME.—Hiram Berden, New York City. Dec. 10, 1866. 4,256.—Railway CARRIAGE AND WAGON.—Samuel Maynard, New York City. Dec. 11, 1866.

3.232.-SoruBBING MACHINE.-Andrew Irion, Femme Osage, Mo. Dec. 18, 1866.

3,430.-NAUTICAL LOG.-Truman Hotchkiss, Stratford, Conn. Dec. 29, 186

3,452.-METHOD OF EFFECTING THE CUTTING-OFF IN STEAM ENGINES, ALSO THE REGULATOR FOR CONTROLLING THE SPEED OF STEAM ENGINES, CGeo, H. Babcock and Stephen Wilcox, Jr., Providence, R. L. Dut, SJ, 1559,



THE PROPOSED ARCADE RAILWAY AND AVENUE UNDER BROADWAY. DESIGNED BY S. B. B. NOWLAN, C. E.-[See next page.]

Scientific <u>American</u>.

MUNN & COMPANY, Editors and Proprietors.

PUBLISHED WEEKLY AT NO. 37 PARK ROW (PARK BUILDING), NEW YORK.

O. D. MUNN, S. H. WALES, A. E. BEACH.

127" "The American News Company," Agents, 121 Nassau street, New York The Messrs, Sampson Low, Son & Co., Booksellers, 47 Ludgate Hill, London England, are the Agents to receive European subscriptions or advertisements for the SCIENTIFIC AMERICAN. Orders sent on them will be promptly attend-ed to.

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VOL. XVI., No. 6....[New Series.] Twenty-first Year.

NEW YORK, SATURDAY, FEBRUARY 9, 1867.

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HAVING AN OBJECT AND STICKING TO IT.

Persistence in any chosen vocation is an essential to success. This is a general rule, but we desire now only to apply it to the business of the mechanic. Constant practice, constant study, and constant application are conditions precedent to perfection. But even these will be wasted if the occupation chosen is unfitted to the natural qualifications of the workman. Some are born without any natural aptness for the mechanical arts. Every mechanic understands what is meant by a "mechanical eye." The want in the visual organs thus characterized does not necessarily imply that there is a disease or malformation of the optic nerve, but rather that there is no judgment to direct and guide the eye. The infant grasps as readily at the moon as at his rattle within a few inches of his face. In time, by repeated experiments, he learns the relative distances and dimensions of objects. All are capable of this amount of judgment, but in the practice of mechanics a much higher degree of experience is required and a much closer exercise of the judgment. There are some men who may practice at a mechanical trade their whole life long and never be even passable workmen. They never can tell whether a line is straight, or a surface level, even with the aid of levels and straight-edges We remember an instance in point, where a young man ar dently desirous of becoming a machinist was compelled to forego his favorite business because of this imperfection-the want of a "mechanical eye." His first job was the centering of some pieces of round iron, seven inches long and one and one-eighth inches diameter. He worked with vice, hammer, center punch, and bench centers half a day on twelve pieces, yet he did not correctly center a single one, although he received repeated instructions and examples from the foreman. Indeed he could not, even with the aid of chalk held against the revolving surfaces of the cylinders, see in what respect they were not true. Such an apprentice could never become a workman and his failure would result from no fault capable of remedy. Many employers have had a similar experience with their apprentices, or with those who called themselves workmen. The first requisite, therefore, is to have a proper object, one fitted to the capabilities.

for granted that every beginner at a mechanical business enters it with the intention and purpose of becoming a first

position of a first class workman by patient practice, must preserve and hold that position by constant endeavor.

There are others who "stick to it" in a different way. These are they who having spent a limited time in a shop assume to know all they have ever had to do and also all they have seen others do. They have done with learning. In their own estimation they are perfect. When seeking a job they assume a thorough knowledge of the work to be performed and the method of doing it. These men soon find their level. We knew once of such a prodigy who hired into a machine shop and had for his first job the turning of connecting bars tapering from center to ends. He asked a fellow workman how he should turn them. The answer was: 'Set the tail of your lathe over," meaning to move transversely the upper portion of the tail-stock to the proper angle. He understood it literally and procuring a crow-bar was swinging the lathe frame out of line with the driving shaft when the foreman discovered him. His services were incontinently dispensed with.

Mechanical art does not need such helpers. It needs men with a purpose; men who are willing and ardent to learn; men who are not dismayed at obstacles, but who take a pride in either removing or overcoming them. Only such will ever become mechanics worthy the name. The others are abortions.

CROSSING THE WATER FERRIES, TUNNELS, AND BRIDGES.

Those who are compelled to use the ferries running from Manhattan to Long Island and to the Jerseyshore have been severely tried in temper during a portion of last month. Immense fields of fixed ice, or floating floes driven by keen cut ting gales, have interrupted the only mode of transit between the metropolis and Brooklyn, Williamsburgh, Jersey City, Hoboken, and Staten Island, and crowds of anxious and disappointed people in all these places have been put to great inconvenience and expense. It would be a blessing not only to the dwellers in all these localities, but to the transient traveling public and the people of the whole country if some permanent remedy and preventive could be adopted and applied; for whatever delays the ordinary routine of business in this, the commercial heart of the country, must be felt in its effects, to a greater or less degree, throughout the land.

It may not be expected that human ingenuity and foresight can in all cases neutralize the opposition of the elements to the means of transportation; but in this case it would seem that there are several remedies, either one of which, or at least all combined, might bid defiance to wind, water, and frost. The boats used in fair summer weather might be so modified in construction as to be fitted for battling with the ice withou impairing their convenience as comfortable vehicles for pass-t engers. Or one, two, or more ice boats, intended for forcing their way through icy obstructions, might be provided to kcep the paths of the different ferries open, and be employed in summer as powerful tugs, so that they would, during the fairweather season, earn enough to at least partially pay for their | a few of the most important. needed pioneer winter service.

But there is a radical remedy better than either of these. That is to make a permanent crossing between New York and the suburbs on eitherside by means of tunnels, bridges, or both. There are no obstacles impossible to be surmounted in Park and running along Park Row, Chatham street and either of these. Tunnels may be drifted through the strata which form the beds of the rivers, or made of iron in sections, sunk and secured together to make continuous tubes. Tunnels of this latter class may be built of such weight and would have no more effect on them than on the immovable rocks; but legal precautions could be taken to prevent such accidents.

There does not appear to be any insuperable impediments to the throwing of bridges across from one shore to the other on both sides of the city. The lowness of the shores on the New York margins, both sides, and on the North River Jersey shore, could be compensated for by extending the bridge on open causeways up some distance from the water's edge, landing passengers and teams in the heart of the cities ; on the Brooklyn shore the Hights offer an excellent starting point, and from the termini of these bridges might radiate in every direction lines of horse railroads or other means of conveyance to whatever point to be reached. These bridges should be

spirit, or our mechanical progress that the people of the metropolis and of the whole country should be satisfied with such insufficient means of intercommunication as those which now so inadequately accommodate them.

THE ARCADE RAILWAY.

Upon the opposite page we present an illustration of the great Arcade Railway which is now proposed for immediate construction under Broadway, by H. C. Gardner, Esq., and Hon. Melville C. Smith, from designs by S. B. B. Nowlan, C. E. This is probably the most thoroughly comprehensive and excellent of any of the various plans that have been suggested, for while it provides the most abundant means for rapid passenger transit and relief of the streets, it does not block up any part of the city, but, on the contrary, adds enormously to the available street space. In short this plan contemplates nothing less than the addition to the city of an immense avenue, which is to traverse the heart of the metropolis, increasing its wonderful attractions, augmenting the value of its property, and giving to the people the great boon of sure, rapid and cheap communication.

We think there are few persons whe will not be at once favorably impressed with the practical excellence of this plan. The principal objection to be raised will be its apparently enormous expense. But the cost will be comparatively nothing compared with the immense public advantages that would result from its successful construction, and we trust that the enterprising men who have charge of the matter will receive all possible encouragement. It is estimated that the expense will not exceed \$2,000,000 per mile. The cost of the London tunnel railway now in profitable operation is stated to have been \$5,500,000 per mile, the greater portion of which must have been paid for the purchase of the right of way.

Our view is taken from near the corner of Wall street looking up Broadway. The plan, as seen, is not merely to tunnel under the street, but to remove the street itself, block by block, from wall to wall, and construct another street at the depth of fifteen feet, supporting the present street level on arches, and making stores in what are now the basements and sub-basements of buildings. Below all are the sewers, with tunnels for the passage of carts which reremove the offal, etc., that naturally finds its way to the lowest level. This lower portion is to be of the best masonry, strengthening the foundation walls of the buildings and giving ample support to the superstructure. Light-daylight-is afforded the sub-street or arcade by areas inclosed with iron railings between the upper roadway and sidewalk, ample room for which will be found when the upper street will be relieved by the construction of the lower. At convenient intervals flights of steps will lead from these areas to the street below, and the pedestrians as well as those who ride in the cars, will be sheltered from the storms of winter and the suns of summer.

This is a general idea of the plan. Those who have the matter in hand have omitted, apparently, no detail to insure entire success should the plan be adopted. We will mention

To use the streets from the Battery along Broadway to Ninth avenue, thence to 150th street, thence to a junction with the Hudson River Railroad near Fort Washington. Also a branch beginning on Broadway below City Hall the Bowery to Third avenue, thence along that avenue to the Harlem River, thence along the river to a point intersecting the Harlem Railroad. The main road and branch to have at least four tracks with room for constructstrength that even the anchors of vessels dragging in a gale ing additional tramways. The streets to be excavated their entire width to a depth of twenty-five feet, the lower ten feet to be occupied by sewers and vaults. Under the buildings exposed by this excavation a range of basement stores to be constructed by the company without cost to the adjoining proprietors and finished in the same or a corresponding style with those above. Walks to be laid as now on the streets above. The railroad to be covered by a roof supported on iron colonnades between walk and track and between the two roadways, covered with heavy plank filled in with concrete, supporting a water-tight iron pavement, constituting the upper roadway. Ample precautions for the support of the buildings and arrangements for conveying the sewage, gas, and water, to be provided by the company.

The method of construction proposed is that the street to suspended at an elevation sufficient to allow the passage of be excavated will be taken up one half side of a block or shipping under them at all states of the tide. Probably a square at a time, so as not to interrupt travel more than in Another of more importance is to stick to it. We take it pneumatic tube across the East River will be un fait accompli the erection of any new building, the supply of gas, water, ere long, but valuable as it might, and probably would be for and the convenience of sewerage to be kept up during the the transmission of freight in parcels, it would be some time progress of the work. The cars on the outside tracks in this lower street are to be run at the rate of about five miles per hour, and intended for way passengers. Those on the inside tracks to run at fifteen miles an hour, to stop only at stated points, all to be drawn by locomotives emitting neither smoke nor sparks. The necessity of some thorough and permanent relief to our over crowded streets is too apparent to require argument. The advantages of this plan are readily seen from the foregoing remarks. Freight and passengers will be largely diverted from the present routes, both being sheltered from the elcments, whether storm or shine. The upper roadway will be kept in more passable condition in respect to snow and ice by the latent heat from the immense mass of iron used in the building of the arcade. Property owners on the streets will be gainers by an addition to their rentable property, and the sub-roadway will become a favorite means of transit in stormy weather and as a shelter from torrid suns Better facilities than now exist will be afforded for the repair of our gas, water, and sewerage pipes, and it will be an attraction to out of town visitors second only to that of the

class workman. If not it is more than probable he will never reach even mediocrity. If he is satisfied to serve his time, blundering through his work without understanding it, he will come out one of those nuisances to employers and disgracers to workmen, a "poor tool." Such professional workmen cannot stay long in any situation and are compelled to accept the most distasteful work with the lowest wages, Even under these circumstances there might be hope for them if they would, thus late, endeavor to stick to their business; but, being disheartened, they drift about "from pillar to post," trying this and attempting that, and succeeding in nothing because they will not thoroughly, and honestly, and persistently apply themselves to their business.

Soon apprentices think that when they have achieved the triumph of doing one job in a single department of their business their trade is learned and their position secure. They do not seem to realize that although the customary or legal term of their novitiate has expired they are still learners. New methods of doing work, new tools, new descriptions of work, new combinations of materials are continually being man has done man may do," and where the necessity is so

before it would become a favorite and popular route for passengers. People prefer to see unavoidable and certain dangers rather than to dread in darkness unknown perils, and the public demand would, we think, be better met by elevated bridges or well-managed ferries than by pneumatic or other tunnels.

But all these methods appear to be feasible. In the advanced stage of engineering science to which we have arrived it is puerile to denounce any such project on account of imaginary or estimated difficulties or the cost of the work. While English and French engineers are seriously considering and estimating upon the project of uniting their two countries by a tunnel of over twenty miles, under one of the

stormiest seas on the globe, we ought not to shrink from so comparatively trifling a job as tunneling the narrow strips of inland water which separate us from almost contiguous shores. As to bridges, we have the example of the Menai Straits bridge, the Victoria, the Niagara, and lately the Cincinnati and Covington and the Havre de Grace structures. "What brought forward, and the mechanic who has attained the apparent it is not creditable either to our enterprise, public great Central Park.

THE RECOIL OF GUNS ACTION AND REACTION NOT EQUAL.

BY PROFESSOR CHARLES A. SEELY.

In my days of gunning, long time ago, one of the mysteries among the boys was the recoil of our guns. We had theories and superstitions about it which are not worth repeating. But out of my experience I have brought a very distinct remembrance that the "kicking" was something that we were afraid of and that there was a great difference in the vicious propensities of our guns. It must be borne in mind that the shoulder of a boy is tender, and cannot easily bear a blow which a stout man might not notice. The kicking power seemed to us one of the most noteworthy properties of guns. There was a gun which was famous all over the county as a great kicker : it was said it could kick us into the "middle of next week," a distance we thought to be very considerable.

During the progress of the rebellion, when every one was a strategist and a critic on the art of war. I assisted in many discussions on the philosophy of the recoil of guns. I found that no one lacked experience or an opinion. But the opinions were generally incorrect, and those which were right were not fortified by good reasons. So I think a renewal of the discussion may be interesting and profitable.

The expansive force of burning gunpowder is the source and the only source of the movement of the shot and the gun. The force of the powder is expended upon and divided between the shot and the gun, and for my present purpose it may be considered that the force of the powder equals the force of the shot plus the force of the recoil. So far all are agreed: there is no difference of opinion. The debatable question is this: What is the relation of the force of the shot to the force of the recoil; are they equal, and if nay, why not? 'To put the case in its simplest terms: the shot and the gun are two unequal weights acted on at the same time and for the same length of time by an elastic substance pushing them apart.

People generally think that the powder force is equally divided between the shot and the gun, and that the relative weights of the shot and the gun are not to be taken into account. They found their opinion upon a supposed law of motion, that action and reaction are equal, and upon a supposition that the pressure upon the gun is the same as upon the shot. Now as to the law of motion, it is either misunderstood or it is absolutely unfounded. If action implies motion and force, a simultaneous and equal reaction to my mind is incon ceivable. If there be a motion, any obstruction or reaction to it, as long as the motion continues, surely cannot be equal to the impelling force. If my neighbor push me down, his action is greater than my simultaneous reaction: I may get up and get even with him, but then there comes into the case a new action and reaction. It may be that all motions will finally cease by reason of reactions, but when the rest takes place, it is hardly proper to say that there is still action and reaction. Is not the alleged law of motion a very imperfect way of expressing a self-evident fact about rest or equilibrium? It certainly is not easy to see how the little truth it embodies has any application to the question of the recoil of guns. The fact is that people who quote this law generally misapply it.

The pressure on the shot and the gun may be considered as equal (if there is any difference it is greater on the gun), and the expansive force acts an equal time on each. But those who infer an equal division of the force, overlook a very essential element in their calculation. The shot moves faster than the gun and the force acts on the ball through a much greater space. Is not the space through which a force acts something to be as carefully considered as the time?

Take two balls of equal weight and place a spring between them which will impel them apart. In this case the force of the spring is conveyed to the balls and is equally divided between them : one moves as far and with as much force as the other. Now place one end of the spring against an immovable abutment, and allow it to expand against a single ball. Here the pressure on the ball and the abutment are equal, but the spring expands to its full length and gives its whole force to the ball: there is nothing lost on the abutment. The force imparted to the ball is precisely twice that which it received in the first experiment. Repeat the first experiment with balls of different weights. For example, let one have double the weight of the other. The force will now be divided so that the light ball will receive twice as much as the heavy. From such experiments the conclusion will soon be reached. that the force of the spring will be divided between the balls in a ratio inversely as their weights: if the weights of the balls be as 1 to 10, they will receive the force in the ratio 10 to 1. If a well-made spiral spring be employed, it may be observed in each experiment that there is a neutral point which does not move at all and that it is the center of gravity of the two combined balls. Thus when two balls of equal weights and sizes are used, it will be in the middle of the spring: in the second experiment it will be in contact with the abutment: in the case of the balls of weights 1 to 2, it will be two thirds the distance between the balls from the ball, 1. Thus this point indicates the division line between the amounts of force going to the balls respectively. Such experiments may be varied by using a contracting instead of an expanding force. Take two toy wagons, connected by a rubber cord, and use weights of any convenient material. Or the weights may be suspended by cords, to be drawn together by the contraction of a rubber spring. The result will always be arrived at that the forces will be divided inversely as the weights. Moreover it should be observed that the velocities communicated to the balls are inversely as their weights. In the case of the balls 1:2, the corresponding velocities will be 2:1,

In these experiments we have a fair representation of the case of the gun: the spring is the expansive force of the powder, the large ball is the gun, and the small ball is the shot Can the conclusion be doubted that the force of recoil is to the force of the shot as the weight of the shot is to the weight of the gun. If the weight of the gun be 100 lbs. and the shot 1 lb., then the force of the shot will be 100 times that of the gun.

Those who are well skilled in mechanics will reach the same conclusion by a shorter road. The formula MV² expresses the value of the force of a body. The weight (M) of the shot and of the gun of course are known, and as soon as it is determined that the velocities of shot and gun are inversely as their weights, the problem is solved. Thus, let the weights be as 1 to 100, then the velocities will be as 100 to 1, and the expression for the force of the shot will be $1 \times (100)^2 = 10,000$, and the force of recoil $100 \times (1)^2 = 100$. But 10,000:100::100:1.

It is a plain result of the theory above given that the force of the recoil is directly proportioned to the amount of powder used. And in a given gun is proportioned to the weight of the shot, or if the shot be the same, to the weight of the gun. By doubling the weight of the shot the recoil is doubled.

If the prevailing notion about recoil were true, we should have a very different system of warfare, for the danger in battle would be to those who fired the guns. It involves, also, other absurd consequences, such as that in the steam engine half of the force of the steam is lost on the end of the cylinder, and that we can never utilize the whole of any force.

In conclusion, I am obliged to say that the guns and shot I have spoken of are model and theoretical guns, and that there are difficulties in the way of directly applying the theory to actual practice. The force of the powder does not show the whole of itself in the shot and in the recoil. A notable amount is lost in the concussion of the gun, windage, and in overcoming the friction of the shot. This last is a very important circumstance, as it holds back the shot, giving the gun a longer time than due it to absorb the powder force. The ratio of recoil to shot will always be greater than by the simple formula I have given. The guns need more lubricators. And it will be seen that there is plenty of room for practical experiments; nothing to-day would more please me than to read reports of intelligent practical tests.

PROVING A GREAT GUN.-The second big gun (20 inch) cast at the Fort Pitt Foundery has been tested with charges of 60, 80, and 100 pounds of powder, and shot weighing 1,020 pounds. The trial was under the inspection of Commodore Taylor, of the United States Navy, now on inspection duty at the works, who was well satisfied with the trial and pronounced the gun thoroughly fitted for duty.



ISSUED FROM THE U.S. PATENT OFFICE FOR THE WEEK ENDING JAN. 22, 1867. Reported Officially for the Scientific American.

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127 Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much ther information useful to inventors, may be had gratis by addressing MUNN & Co., Publishers of the SCIENTIFIC AMERICAN, New York.

61,304.—CABBAGE CUTTER.—Henry Acuer, Muscatine, Iowa. First, I claim the manner substantially as herein described and shown of arranging a series of scroll knives on a rotary bed, and beneath a stationary hopper, so that two or more knives are made to cut at the same time, under the same hoppers, as shown. Second, The arranging with a cabbage cutter bed, such as described, of the frame, A B, with box, E, hinged legs, G G, gnard board, F, and bracket ex-tension, substantially as described, and for the purposes set forth.

61,309.—Apparatus for Carbureting Gas and Air.—John

01,009.—APPARATUS FOR CARBURETING GAS AND AIR.—John F. Boynton, Syracuse, N. Y. First, Iclaim in a carbureting box or vessel a tube or tubes, whether flat. cy.indrical, or of other form, filed with fibrons or capillary material, and so arranged with openings at tube bottom that the carbonizing fluid will be constantly drawn by capillary action from the lower and heavier strata, and subjected to evaporization in the upper portion of the vessel, substantially as decompt.

described. Second, In a carburcting box or vessel constructed and operating as herein described, I claim so arranging the capillary tubes that the gas in its passage through the vessel will move slowly in a thin stratum over the ends of the wicks containing the carbonizing fluid substantially as described. Third, I also claim dividing the carbureting vessel into two or more com-partments, by soldering one of the plates forming each of the double parti-tions or wick tubes to the bottom and sides of the vessel, so that two or more different carbonizing fluids may be used in the same vessel, without mixing previous to evaporation.

61,310.-THILL COUPLING.-John F. Bridget, Washington, D. C.

I claim the combination of the set screw, G, and socket plate, H, and spring, K, operating to raise the end of the thill in its bearings, substantially as and for the purpose described.

61,311.-BASKET ATTACHMENT FOR PIS'TONS OF DEEP WELL PUMPS.—Erasmus D. Brown, Buffalo, N. Y. I cisim the slotted flaring basket, A, for the purposes and substantially as described.

61,312. - BOAT DETACHING TACKLE. - Samuel Brown (assignor to the Brown and Level Life Saving Tackle

Company), New York City. I claim a boat-connecting appratus, composed of the ring, a, hook, c, and chains, b g, and which is disconnected from the block by slacking the chain, g, in the boat to be launched, substantially in the manner and for the purpose described.

61,313.—MANUFACTURE OF BRANDY.—D. Jay Browne, Cam-bridge, Mass., and Steuben T. Bacon, Boston, Mass. Antedated Jan. 14, 1867.

Anteclated Jan. 14, 1867. First, We claim the blending of brandy or spirits distilled from sorghum sirup, with brandy distilled from fermented grape juice, water and sorghum sirup, or glucose, substantially as herein set iorth. Second, Inthe production of brandy from the combination of the above-named materials, we also claim the mode of fermenting in close casks, or vats, furnished with tubes or coils within, for regulating the temperature of the liquids while fermenting, substantially as herein specified. Third, In the production of brandy from the above-named ingredients, as necessary to secure success, we also claim the process or distilling in vacuo, substantially as and for the purposes herein described.

61,314.—PROCESS OF MAKING SUGAR.—Duncan Bruce, Ross-

ville, N. Y. Antedated Jan. 17, 1867. First, I claim the combination of the vacuum chamber and condensing chamber, with one or more evaporatory chambers, having steam or hot water heaters applied to them, substantially as described. Second, The combination of one or more air-tight vessels with one or more air-tight evaporators and a condensing chamber, D, which communicates with a vacuum chamber, E, substantially as described.

61,315.—Apparatus for Decomposing Animal and Veg-ETABLE SUBSTANCES, FOR CURING MEAT, TANNING, ETC.—Duncan Bruce, Rossville, N. Y. Antedated Jan. 17. 1867.

17, 1867. First, I claim an apparatus consisting of a series of air-tight vessels com-municating with a condensing vessel, and also with a vacuum reservoir, hav-ing a forcing and extanusting eneme applied to it, the whole to be used sub-stantially as described in the treatment of vegetable and animal matters. Second, Curing meat by the means and in the manner substantially as herein described. Third, The process, substantially as described, of obtaining grease from faty substances, by subjecting these substances to the action of moist heat in a vacuum.

61.316.—PRESERVING GREEN CORN.—S. John Carroll, Baltimore, Md.

I claim preserving green corn in the manner substantially as herein set forth and descr. bed. I also claim the new article of mannfacture and commerce, green corn pre-served substantially as herein set forth and described.

61,317.-BUTTON.-Henry T. Carter, Portland, Me.

f claim a button provided with a slitted and pointed shank, c, in combina-tion with the disk, d, and washer, b, substantially as described and for the the purpose specified.

61,318. — MACHINE FOR PRESSING FUEL INTO BLOCKS OR BRICKS.—John B. Collen, Philadelphia, Pa. I claim a machine constructed, arranged, and operated substantially as herein described and represented, for the purpose of pressing artificial or nat-ural fuel in a fine or grann lar state into blocks or bricks for transportation and for burning, as set forth.

61.319.-PUMP.-H. Comstock, Seneca Falls, N. Y.

1,319.— FUMP.— II. Collisiock, Scheck Falls, N. I. Iclaim, First, The combination of the rubber cup or flange, f, with the metallic leather packing, c, operating substantially in the manner and for the purpose specified. Second, The groove, g, in the bottom of the cylinder, in combination with the valve yoke, C, operating substantially as and for the purpose set forth.

61,320.-DENTIFRICE.-John G. Cook, Lewiston, Me.

I claim as a dentifrice a chlorate compound, made up of ingredients, sub-stantially as described.

61,321.-SAFETY PAPER.-L. M. Crane, Ballston, N. Y.

01,021.—DAFETY FAFER.—D. M. Craffe, Dailstoff, N. 1. I claim, First, The inserting or incorporating of one or more threads or stdps of guita percha, or a material possessing like properties, into the pulp orfiber of paper during the nanufacture of the same, and in such a manner that said threads or strips will be softened and firmly united to the fiber un-der the heat of the drying cylinders, substantially as set forth. Second, I also claim, as an improved article of manufacture, a safety record paper, made substantially as herein shown and described.

61.322.-Machine for Preparing Cotton, etc.-W. Crighton and F. W. Crighton, Manchester, Eng. Patented

ton and F. W. Crighton, Manchester, Eng. Patented in England April 3d, 1861. We claim, First, The arrangement hereinbefore described consisting of placing the beaters or openers on a vertical axis, and forming the place or opening for the delivery of the cotton at the top of said case, or at a point ingher than that at which the cotton is the top of said case, and a point of the dirivery of the cotton at the bottom of the beater case or cone, or through open rings at a lower point than that at which the prepared cot-ton is delivered, substantiably as hereinbefore set forth. Second, The combination with a beater case, and beaters, or other similar apparatus for cleaning cotton of the carrier or series of dirt boxes, d, sub-stantially as hereinabove set forth.

61,323.-BLAST FOR IRON AND OTHER FURNACES.-Felix A.

T. de Beauregard, Paris, France. I claim surrounding the furnace by a tank the water within which is con-verted into steam by the heat of said furnace and then discharged through suitable pipes or conduits arranged substantially as herein described, so the discharge of the said steam shall induce a blast within and through the fur-nace, as set forth.

61,324.-STEAM GENERATOR.-Jules Delery, St. Bernard Parish. La.

rarish, La. I claim the isolating check valve, b, connecting rods, E and L, and lever, J, in combination with the generator and water communication pipe, substan tially in the manner shown and described. 61,325.-TELEGRAPHIC CABLE.-A. J. B. De Morat, Phila-

delphia, Pa. onstruction of telegraphic cable by means of insulated tubes T claim or commutous commences, normed of nencally wound strips in such man-ner as to preserve uninterrupted linear conduction in case of stretching, as a herein set forth, or any other substantially the same, and which will produce these intended effects.

tension, substantially as described, and for the purposes set forth. 61,305.—MELODEON.—Charles Austin, Concord, N. H. I claim as my invention the arrangement as well as the combination sub-stantially as above specified, of a lever, E, and one or more additional reeds, i, and the operative apparatus thereof, as explained, with the exhaustcham-ber, D, and a main reed key, A or B, thereof, the same being so that on pressing down the said key for the purpose of opening the main reed valve thereot, the lever, E, shall be moved so as to put in operation each additional reed operative apparatus, whereby its reed or reeds may be sounded simul-taneously with the main reed.

61,306. - FAN TOOL FOR CUTTING MOLDINGS. - Edwin C.

Austin, Monroe Village, Wisconsin. First, I claim the knives, C, constructed with the projections or bearings, c, pressing upon the surface of the wood in advance of the cutting edge, sub-stantially as and for the purpose specified. Second, The tool herein described for cutting rope or screw molding, con-structed and operating substantially as described.

61,307.-DOUGH MIXER AND ROLLER.-J. Bailie and J. Gerve

of 307.—Dought MIXER AND ROLLER.—J. Balle and J. Gerv-ers, Cincinnati, Ohio. First, We claim the combination of the rolls, D D, with the worm or screw dough mixer, A, in the manner and for the purpose set forth. Second, ive claim the combination of the carrying band or belt, I, and slabbing rolls, D D, with a worm or screw dough mixer, ni the manner and for the purpose substantially as specified. Third, We further claim the combination and arrangement of the spur and worm gear as shown for regulating the speed and giving a positive motion to the screw, A, slabbing rolls, D D, and carrying band, 1°, for the purpose and in the manner substantially as described.

61,308.-BILLIARD CUSHION.-A. Bassford, New York City. First, I claim in a billiard cushion the use of metallic ribbon or other hard and clastic strip interposed between two pieces of vulcanized india rubber of different degrees of elasticity, or within a rubber cushion substantially as herein set forth.

herein set forth. Second, In billard cushions constructed substantially as set forth. I claim the arrangement herein described and represented, whereby one block of india rubber is backed and supported by the other. Third, I claim the two blocks or stips of vulcanized rubber, of unequal degrees of elasticity as described, in combination with the spring steel ribbon and rubber packing, arranged substantially as and for the purposes herein set forth.

61,326.—WHEAT DRILL.—Geo. W. Doolittle, Lincoln, Ill. First, I claim the jointed frame, A C, to which the compressing wheels, D E, are attached, in combination with the funnels, L L, depositing tubes, K, angular bars, I I, cutter blades, H H, substantially as arranged for the purpo angular bar ses set forth

ses set forth. Second, I claim the arrangement of the standard, P, lever, m, csster, n, for controlling the depth of the drills, K, or lifting them out of the earth in com-bination with the drills or delivery tubes, and the mechanism for regulating the quantity of seed, substantially as herein described for the purposes specified.

61.327.—WASHING MACHINE.—George H. Dow. Freeport. Ill. I claim the arms, E E, roller upper board, C, and pressure board, F, in combination with the concave washboard, H, lower roller board, C, and springs, D, arranged as and for the purpose set forth.

61,328.—BARREL BUNGS.—M. S. Drake, Newark, N. Y.

I claim, as a new article of manufacture, a bung for barrels, casks, or cases, constructed substantially as specified.

61,329. - TAIL BOARD FOR WAGONS. - Joseph O. Farrell,

Ol 329. — IALL DOARD FOR WARDER TO A WARDER TO STATE THE STATE OF THE

61,330.—SAFETY VALVE.—John H. Fitz Simmons, Susque-

hanna Depot, Penn. I claim the combined valves, F and E, with valve seats, A and C, the steam pipes, G G, together with the releasing screw, X, as herein described and for the purpose set forth.

61,331,-CHERRY STONER.-F. G. and E. A. Floyd, Macomb, Ill. First, We claim the knife or stone retainer, o, when constructed in the man

First, we claim the knile of stone retainer, o, when constructed in the man-ner shown, and supported on the single arm to permit it to operate in connec-tion with the reciprocating bar, c, substantially as herein set forth. Second, The reciprocating bar, c, having the plates, n, attached and pro-vided with the holes, e, when used in combination with the knives, o, sub-stantially as shown and described. Third, The hopper, B, reciprocating bar, c, knives, o, and bed piece, e, all arranged and operating as described.

61,332.-CLAMP FOR RAISING TIMBER FRAMES.-E. G. Ford and H. Weible, Delphos, Ohio, assignors to E. G. and J. G. Ford.

We claim the hinged bars, C D, constructed and arranged to operate sub stantially as and for the purpose set forth.

61,333.-SHAKER ATTACHMENT FOR THRASHING MACHINES.-

David Frost, Dupage, III. Iclaim the application of the slotted lapping plates, confined together by a thumb screw, to the pitman and vibrating knockers or shakers of a straw-carrier belt all in the manner and for the purpose described.

61.334.-MACHINE FOR RIVETING BUTTONS TO FABRICS.-W

61,334.—MACHINE FOR KIVETING BUTTONS TO FABRICS.—W. J. Gordon, Philadelphia, Pa. I claim, First, The lever, H in combination with the spindle, D, having a pointed projection, I, when the lever is provided with a beveled eccentric projection, w, or its equivalent, and when the spindle is so constructed and arranged, in respect to the lever, that on operating the latter, the spindle will turn around as it descends, for the purpose specified. Second, The combination of the above with the siever, E, having a projec-tion adapted to the cavity in the button, and with the springs, h and n, the whole being arranged for joint action, as and for the purpose described. Third, The concavity, so formed in the base, A, in respect to the head of the rivet, and to the devices for spreading the latter, that, on forcing the rivet into the said concavity, the edges of the said head will be turned up, as and for the purpose described.

61,335.-Support for Window Sash.-Ellen M. Griswold

Hagerstown, Md. I claim the application to window frames of a sash support composed of the adjustable pieces, C C' C'', connected by hinges, substantially as and for the purposes set forth.

61,336.—APPARATUS FOR DETACHING BOATS.—Increase S. Hill, Boston, Muss, and Andrew Burnham, Chelsea, Mass. We claim, First, The arrangement of curved disengaging rods in guides along by the gunwale of a boat, substantially as herein described, when the same are connected with a pivoted lever through the operation of which the disengaging rods are simultaneously retracted liberating the links by which the boat is suspended. Second, A graduating coupling in the disengaging rods by means of which the lengths thereof may be so adjusted as to secure simultaneous disengage.

the lengths thereof may be so adjusted as to secure simultaneous disengage ment of the suspending links, as and for the purpose described.

61,337.-CAN FOR PAINT, ETC.-William A. Hopkins, New

York City. I claim the combination of the can, cover, ears and clamps when the same are combined, constructed, and operate substantially as shown for the purpose specified.

61,338.—WRITING PAPER.—J. E. Hover, Philadelphia, Pa. I claim as a new manufacture, writing paper, the surface of which is contect with chalk or other material which will neutrlaize the acids in writing inks or fluids or fluids.

61,339.—Apparatus for Obtaining and Applying Motive POWER.-William Huston (assignor to himself and H. N. Wickersham), Wilmington, Del. Antedated Jan. 19, 1867.

First, I claim the combination of the disk, \mathbf{F} , and its chamber, \mathbf{X} , and the disk, \mathbf{F}' , and its chamber, \mathbf{X}' , with the piston, \mathbf{G} , the whole being arranged for joint action, substantially as and for the purpose herein set forth. Second, In combination with the above, I claim the heads, \mathbf{B} and \mathbf{B}' , with the recesses and openings arranged substantially as described. Third, The combination of said disks, piston and heads with a casing, \mathbf{A} .

61,340.-WRENCH.-Joel C. Jackson, Rochester, N. Y. An

tedated Jan. 17, 1867. I claim the peripheral recesses or groove, o, in the wrench barrel, c formed with ratchet teeth in its bottom surface, in combinution with the stor lever pawl, d, within the stock, b, as and for the purposes set forth.

61,341.-FILE CUTTING MACHINE.-A. F. Johnson, Boston,

61,341.—FILE CUTTING MACHINE.—A. F. Johnson, Boston, Mass., and M. P. Griffin, Medford, Mass.
First, We claim the combination of a swiveling head with a retary stock, substantially as described.
Second, The combination of a chisel and adjuster with a rotary stock, in the manner substantially as described.
Third, Placing the chisel and adjuster together in the same stock, when constructed and arranged as described.
Fourth, The lever, D, in combination with the tool stock.
Fitth, The adjustable screw jaws, T U, in combination with the ratchet, f, thescrew, S, and bed, B.
Sixth, Inserting rubber blocks at the ends and between the bows of the elliptic springs, 1 1, in a file-cutting machine, constructed substantially as de-scribed.

61.342.-CAST-IRON CHIMNEY.-David June, Fremont, Ohio I claim the section, B, in two parts, C C, with cavities, E E, in combination with section, B', in two parts, C C, with cavities, E E, in combination the purpose herein described.

61,343.-WASHING MACHINE.-C. H. Knox, Mt. Pleasant Iowa.

I claim the bolt, R, in combination with the clamp. T, friction roller, L plates, K and F, as set forth.

61,344.—SELF TRACK-LAYING CAR.—Jesse S. Lake, Smith's

501,044.—504. TRACK-DATING CAR.—526586 S. Lake, Shiftin S. Landing, N. J. First, I claim the combination with a track car cr vehicle of the within-described revolving track consisting of an endless series of trucks or floats, I P Q I, connected together by lexible chains, cords or straps, K, and operating in the manner and for the purpose specified. Second, I claim the combination with the runners or ways, H H, cylinder, G, and crutch, M, of the flanges, B B B' B', the latter, B', being hinged or pivoted to admit of lateral adjustment in order to vary the course of the car or vehicle, substantially as described.

61,345. - CARTRIDGE BOX. - M. C. Leonard, Washington,

D. C. I claim a cartridge lined with sheep skin, or other equivalent material, and for the purpose set forth.

61,346.-WINDOW-SHADE SUPPORTER.-T. J. Marinus, In-

dependence, Iowa. I claim, in a window shade, the combination of the clamp composed of lever, H, the hollow frame, F, and spring, I, with the cord for raising shade, all constructed in the manner and for the purpose herein set forth.

61,347.—QUARTZ CRUSHER.—Carlile Mason, Chicago, Ill. 01,021, --- VUARTZ UKUSHER, --- UARTHE MASON, UhlCaCO, HI First, I claim the conical crushing disks, m, having their faces corrugated, substautially as shown, and arranged to operate in connection with each other, as set forth. Second, The tension frame consisting of the rods, y, and the keys or wedges, a, arranged to operate in connection with the crushing disks, m, as shown and described. Third, In combination with the tension frame as above described, I claim the spring beans, w, and theset screws, e, arranged and operating as and for the purpose set forth.

61,353.-CLOTHES WRINGER.-George Palmer, Littlestown,

Pa. First, I claim placing ribs of metal longitudinally in hard wood rollers for lothes wringer, when covered with clastic substances, subtantially as herein cloutes winger, when one one and the set forth. Second, I claim, in combination with clothes wringer rollers as described, the pressure lever, Q, balls, v, or other equivalent, spring and rack bar, Y, operating as and for the purposes herein specified.

61,354.—DEVICE FOR PREVENTING COLLISION OF LOCOMO-

11,504.—DEVICE FOR TREVENTING Contribution of housing TIVES.—Henry Paync, Sr., Mount Vernon, Ohio. I claim the affixing to locomotive boilers one or more tubes in such manner is herein described, as that by letting steam into them from the boiler, a shaft will be driven or forced forward from each tube to ineed any opposing oi.ject, and thus prevent collision of the locomotive with the object opposing, or when dimusible its force. and thus prevent collision much diminish its force.

61,355.-WRENCH.-John L. Peake (assignor to himself and Louis Guillander), New York City. Antedated January 6. 1867.

I claim the recessed face, a a, on the jaw, A, in combination with the tooth, b, on the jaw, B, adapted to traverse backward and forward by means of the rack, N, segment, M, and lever, C, all arranged for joint operation, so as to act on cylindrical bodies or pipes of different #lameters, all in lines at uniform distances from their centres, substantially as herein set forth.

61,356.—COAL SCUTTLE.—John Pfeifer, Philadelphia, Pa. Froducing a close joint between the body, A, and the bottom, B, of the said coal hod, by means of the concavo-convex bead, a' b', substantially as and for the purpose described.

61,357.-SHUTTLE BINDER FOR LOOMS.-J. C. Poland, Jr.

We claim a shuttle binder made as a lever, pivoted at or near its centre when arranged with adjusting screws, d d'by which the angle of the binder can be changed and the binder can be fixed in position, substantially as de-scribed.

scribed. Also, in the arrangement claimed above, mounting the pivot of the binder on a screw, by which the distance of the whole binder is adjusted with refer-ence to the opposite side of the shuttle box.

61,358.—FLY TRAP.—M. M. Preble, Kokomo, Ind. I claim the combination of the boxes, A and E, and slides, G and F, the said parts being constructed and arranged substantially in the manner and for the purpose set forth.

61,359.—STEREOSCOPE.—De Witt S. Rawson, Peru, III. I claim the picture box, II, the swinging front, D, and shelves or brackets, E E, substantially as herein described.

61,360.-ICE CREAM FREEZER.-John E. Robinson, Boston

61,300.—ICE OREAM FREEZER.—Sound E. RODINSCH, BOSSOH, Mass. I claim, in combination with a freezing vessel, a, the arrangement of a series of cream cylinders, b, to be simultaneously rotated within the same, when each cylinder is so mounted as to be capable of disconnection from the driv-ing mechanism and removed from the freezing vessel, without disturbing the other cream cylinders, substantially as set forth. I also claim, in combination with such an arrangement and method of ope-ration of the cylinders, the stationary scrapers, held in place during the rota-tion of the cylinders substantially as described. Also, mounting each cylinder on a screw shaft, and so as to be removable therefrom, substantially as and for the purpose described.

therefrom substantially as and for the purpose described. 61,361.—TRUNK LOCKS.—E. A. G. Roulstone, Roxbury, Mass. I claim the combination of the spring bolt, 1, and tumblers, c, or locking mechanism, when constructed and arranged to lock and unlock substantially as set forth. Also, combining with the projection, o, of the bolt, the flange, r, with the pin, p, ior receiving the strain of the bolt, substantially as described.

61,362 .-- PORTABLE WATER POWER .-- Abram Rowe, Ma

comb, Ill., assignor to himself, Lorenzo F. Whitman and Reson A. Bowie.

Reson A. BOW16. i st, I claim a portable hydraulic motor for operating machinery, consist-of the propeller or screw wheel, B, enclosed in a case, E, and located in central bottom portion of a boat, A, as herein shown and described. n combination with the wheel, E, arranged as shown, I claim the sluice, C, the front end of the boat having its sides converging as represented. Fi

61.363.—ABRASIVE POWDER.—Jesse Russell, Bath, Maine. n abrasive powders, made by reducing and grading the n

61 864 -METHOD OF UTILIZING WASTE EXTRACTS OF FI 61,304.—METHOD OF UTILIZING WASTE EXTRACTS OF FT-BROUS PLANTS.—George E. Sellers, Sellers' Landing, Ill. First, I claim the vegetable extract of fibrous plants, when obtained in the process of preparing fiber paper stock, in the manner and for the purpose substantially as described. Second, the utilization of the vegetable extract of cane (arundinaria macro-sperma) and other abrous plants, when obtained from them in the process of preparing their fiber for paper stock without other chemical agencies than water or heat, as a new article of commerce.

61,365.—BASE BURNING STOVE.—Charles J. Shepard, Brook

lyn, N. Y.

lyn, N. Y. First, I claim the use or employment of the chamber, B. constructed and operating substantially as described, for the purposes set forth. Second, I claim in a stove with the upper or reservoir chamber constructed substantially as shown, a door placed in position relatively to the grate as shown for the purposes herein fully indicated. Third, The use or employment of water, substantially as shown, for the purposes set forth.

61,366.—Hydrant.—Joseph Nottingham Smith, Jersey City N. J.

I claim the tubular flanged valve, F, operating substantially as herein speci

fied. I also claim the inverted cup-shaped valve seat, D, in combination with the valve, F, substantially as herein described. I also claim the filter, L y, arranged in the hydrant as herein set forth. I also claim the combination of the filter tube, L, with the valve, F, sub-stantially as and for the purpose herein set forth. I also claim the filter suble packing, Q, in combination with the cups, P and T, substantially in the manner and for the purpose herein specified. 61.367. - WINDOW-SCREEN FOR RAILROAD CAR. - F. U

UL, OU. — WINDOW SOCREEN FOR RAILROAD CAR. — F. U. Stokes, Cincinnati, Ohio. Antedated Jan. 6, 1867. I claim asash frame for a railway car window, constructed in such a man-ner that the upper half may be set with glass, and the lower with wire gauze or analogous material, the whole being combined together in the manner and for the purpose herein set forth.

61,368.-Mode of Printing Photographs.-Joseph Wilson

61,305.—MODE OF FRINTING FHOTOGRAFHS.—JOSEPH WINSON Swan, Newcastle-upon-Tyne, England. First, I claim the preparation and use of colored gelatinous tissues, sub-stantially in the manner and for the purpose set forth. Second, The mounting of undeveloped prints, orcained by the use of col-ored gelatinous tissues, in the manner and for the purpose set forth. Third, The retransfer of developed prints, produced as above described. from a temporary to a permanent bisis.

61,369.—MANUFACTURE OF SHOE LACINGS.—J. P. Ferrell,

North Bridgewater, Mass. I claim combining with friction surfaces having a relative reciprocation, a co-operating mechanism which shall draw or feed the strip between these surfaces, substantially as and for the purpose set forth. I also claim in combination with such an arrangement or organization mechanism for releasing the strip from the nippers, mechanism for separat-ing the abradue surfaces, and mechanism for returning the parts to normal position, substantially as set forth.

loop, g g, studs, h h, loops, f1, studs, 55, and tongue, D, in the manner and for the purposes herein fully set forth. Second, The wheels, B and B' with corrugations upon their inner faces and connected to the frame by the short axle, cog bars, P, and metal sildes in the manner and for the purposes specified. Third, The arrangement of the shaft, C, with cog segments, O O, which mesh into the cog bars, P P, and used for elevating or depressing the frame, A, in the manner as set forth. Fourth, The drag, L, with shoe, M, and roller, constructed as set forth, and used with the frame, A, as specified. Fifth, The arrangement of the detachable drilling device, G, constructed specified and used in combination with the frame as specified. Sixth, The our cultivator attachment, H, when used with the frame, A, as

95

Sixtn, Set forth. 61,376.-A GIG OR MACHINE FOR RAISING THE NAP UPON

CLOTH, COMPOSED OF THE FOLLOWING ELEMENTS .- Anton Zschille, Grossenhain, Kingdom of Saxony, assignors to L. T. Downes.

to L. I. DOWNES. Iclaim, First, A gig or machine for raising the nap upon cloth, composed of the following elements. ist, A mechanism for moving the cloth through the machine so as to present plane surfaces to the action of the teazles. 2d, One, two or more pairs of plane surfaced independent teazle plates with mechanism for moving the same, while maintaining their parallelism with the cloth, in ares of a circle or otherwise, so that each plate shall continuous-ly move toward the cloth, sweep transversely and in contact with the cloth from the center.

from the center toward the sides thereol, and then recede, and return toward the center. Sec.nd, I also claim the means herein described for engaging or disengag-ing the cloth with or from the teazle plates, and regulating their pressure of Third. I also claim the method of teazling cloth by machinery, substantially as herein shown and described, that is to say by imparting to the teazling surfaces the following motions, viz: to and from the cloth and also at right angles to the run thereof, so that the nng shall be raised crosswise troin the center or thereabouts to the sides as described.

61,377.—SAW SET.—W. A. Alexander, Mobile, Ala. I claim the combination of the lever, B. pivoted in the block, A', with the recess, b, and the set screw, c, in the block, A, forming an adjustable saw set, constructed and operating substantially as herein described.

-KINDLING FIRES .- Dexter B. Andrews, Fort Wayne, 61,378.

Ind. I claim a composition for kindling fires compounded from the materials and substantially as set forth.

61,379.-Composition for the Manufacture and Pre-

SERVING LEATHER.—Robert Andrews, Milwaukee, Wis. I claim making the composition out of the materials named in the manner named and to se. ure to me the right of using such a composition, and of ap-plying it to leather in the process of manufacture or after it is manufactured and to all articles made of leather, disclaiming every thing but the compos.-

61,380.-Corset and Skirt Supporter Combined.-Wil-

liam Bacheller, West Newberry, Mass. I claim in combination with an ordinary corset, the skirt supporter for which Letters Patent were granted me May 22, 1866, adapted to be worn a d secured together in the manner as and for the purpose specified.

61,381.-GOVERNOR.-William Bakme, New Media, Pa.

I claim the arrangement upon the mill shaft of a pivoted governor ball and arm to actuate a detaching apparatus for the water gate levers, substantially as described.

61,382 — PAPER RULING MACHINE.—George A. Ball, San

61,382 — PAPER RULING MACHINE. — George A. Ball, San Francisco, Cal. First, I claim the division of the cylinder into any number of sections with nippers working between each section and the introducing the movable blocks, ii i, between each nipper to preserve the circular form of the cylinder in combination with the nippers, substantially as described. Second, Covering the cylinder with india-rubber cloth, Z, and placing upon the edge of each section where the nippers strike a strip of gutta percha, Z', as described and for the purposes set iorth. Third, The gage, Jrolls, iI, and lock nuts, m m, affixed to the feed board, in combination with the feed board R.

61,383.—Apparatus for Amalgamating Ores. — Abner 61,383.—APPARATUS FOR AMALGAMATING ORES.—ADDEP Bassett, Virginia City, Nevada. First, I claim the barrel, e, or its equivalent, having a hollow shaft, o, pas-sing through it, by which heat is introduced by exhaust steam or otherwise, substantially as described and for the purpose set forth. Second, I claim the hot-air shell or bath, g, for the purpose of applying heat by exhaust steam or otherwise, to the outside of the vessel containing the pup, whereby obdurate ores are made to amalgamate more freely, sub-stantially as described and for the purpose specified. Third, I claim the application of steam or heat to the ore or pup, both through and around it, without coming in direct contact with it, the said ore or pup being confined in some suitable vessel, said vessel being inclosed in a shell or bath, for the purpose herein set forth. 61 384.—Encre T MANE FOR BOOKS AND SHORS —Williceam

61,384.-Edge Plane for Boots and Shoes.-Willigam

Bayhouse, Foluand, Oregon. First, I claim an edge plane having a cutter, D, with straight and concave edges, and the adjustable slotted guard, F, placed over the said cutter, sub-stantially as described and for the purpose set forth. Second, The guay, C B, with slots, b and b, and the screw, I, for elevating the cutter, in combination with the screw, G, and thumb nut, H, substantially as described and for the purposes set forth.

61,385.—Sorghum Stripper.—Amos Bean, Canaanville,

Object. Solution of the Structure St

61.386.—SIFTING DEVICE FOR GRATES.—Jacob Beesley, Phil-

adelphia, Pa. First, I claim a grate, d, for receiving the ashes and einders, in combination with the sliding frame, C, and projections, e e, the whole being constructed and operating beneath the fire grate of a store heater or furnace, substan-tially as and for the purpose herein set forth. Second, The ribs, cc, with their recesses, x x, in combination with a grate d, and with the sliding frame, C, and its lugs, cc, the whole being arranged substantially as described. Third, The combination of the detachable box, B, grate, d, and sliding frame, C, the whole being constructed and operating substantially as specified.

61,387.—COWL.—W. F. G. Beeuwkes, Holland, Mich. I claim the arrangement of the guard pipes or casings, C F, plate, H, and short cylinder, J, for projecting the roof from the heat of the chimney, sub-stantially as herein shown and described.

61,388.—Apparatus and Preserver for Rectifying Al-

First, I claim introducing chemicals into a rectifying or distilling column for tac purpose of analyzing or purifying, in whole or in part, the contents of such column. Second, Introducing such chemicals at option either in their natural state

COHOL AND OTHER SPIRITS .- Jean Gustave Bequet, Paris, France, assignor to himself and Moritz Pinner, New

Bayhouse, Portland, Oregon.

adelphia, Pa.

York City.

96

61,390.—COMPOUND FOR TELEGRAPH INSULATORS AND FOR OTHER PURPOSES.—John F. Boynton, Syracuse, N. Y. First, I claim as a composition for an electric insulator, a combination of hydrocarbons with silicic acid and silicate of alumina. Second, I claim the combination of sulphur, hydrocarbons, silicic acid, and silicic acid, for the purpose set forth. Third, I claim the combination of sulphur, hydrocarbons, silicic acid, and silicate of alumina, as and for the purpose here inset forth. Fourth, I claim any combinatio. of silicates with sulphur or hydrocarbons, so arranged or combined that when formed into an electric insulator it will be black to dark colored, for the purpose here here specified. Fifth, I also claim saturating earthen ware, brick tiles, drain pipes, porous stone, wood, cast iron, and other hard, porous substances, with the com-pounds here in described, after subjecting said substances to a sufficient degree of heat to expel the air and moisture therefrom, substantially as and for the purposes described.

61,391.—STEAM BLOWER.—G. W. Bright, Philadelphia, Pa. I'claim the arrangement of the shaft, A, the hub, B, the wings, C, the screw, b, and the nut, c, with the jets, e, substantially as herein described for the purposes set forth.

61,392.-Tool for Cutting off Boiler Tubes.-R. H.

Burke, Greenpoint, N. Y. First, I claim the cutter head, G, with feed screw, F, and tubular nut, E, in combination with the cutters, H, and pipe, A, constructed and operating substantially as and for the purpose described. Second, The supplementary sleeves, I, in combination with the pipe, A, and head, G, carrying the cutters, H, substantially as and for the purpose set forth.

61,393.—Cooler for Coffee, etc.—J. Burns, New York

Olyado. Couldr's role corrac, and Corrac, and Corrac, City. First, 1 claim, as an article of manufacture, the portable cooler herein de-scribed, the same consisting of the open mounted pan, A, with perforated faise bottom. B, and connecting tube, D, as and for the purpose specified. Second, The arrangement of the stationary socion blower, E, on the hoor, with the pipe, b, below it, in combination with the removable mounted cooler, A B C, supported by its tube, D, as and for the purpose specified.

61,394.—HARVESTER CUTTER.—Caleb Cadwell, Waukegan, I11.

III. First, I claim a rotary cutter, consisting of the teeth, I, and links, H, in combination with the blocks, G G'g, when constructed and arranged in the manner and for the purpose specified. Second, I claim the arrangement of the cutter, H I, blocks, G G'g guides, M M', roller, L, spring, L', gearing, D E, shaft, B, and bevel pinions, C C, as herein described and represented.

61,395.—SCAFFOLD.—L. B. Carpenter, Milwaukee, Wis. I claim the combination and arrangement of the posts, A, the horizontal sliding timbers, E, the arms, F, crank shafts, H, cranks, I, ropes, J, and pul-leys, K, with each other, substantially as herein described and for the pur-poses set forth.

61,396.—HAND STAMP.—Dexter H. Chamberlain, West Rox-

bury, Mass. First, I claim the the type wheels, a bc, of different diameters, mounted upon separate and independent axes, as and for the purpose set forth. Second, I claim the combination of the inking ribbon with two reels and a stud, in such a manner as to form a double fold of the ribbon underneath the type wheels or die block, substantially as and for the purpose specified.

61,397.—REPAIRING RAILROAD RAILS. — Octave Chanute,

Chicago, IM. I claim a pile for forming a rallway bar, composed of an old or worn rail and a new bar of iron or size for the head and foot, or either, substantially as herein shown and described.

61,398.-MEASURING FUNNELS.-W. B. Cleves, Binghamton,

N. I. I claim the peculiar construction of the measure, A, in combination with the gage tube, B, communicating with the inside of the measure above the faucet, C, with the single scale to indicate the quantity in the vessel, and the stand, D, with the adjustable clamp to hold the measure in its upright posi-tion, substantially as described and for the purposes set forth.

61,399.—CAR COUPLING.—Wm. B. Coates, Philadelphia, Pa I claim the coupling pins constructed in the manner and for the purpose de scribed in this specification.

61,400.—FILTERING TUBE FOR WELLS.—Chas. C. Cole, Northfield. Vt.

refull, ye. rst, I claim protecting the countersunk strainers, A, by hinged plates, D ationary plates, B, substantially as represented and described. cond, The combination of the cone or cup-shaped strainers, G, with the ng, substantially as herein shown and described. Firs tubing

61,401.—FURNACE SHIELD.—Edward S. Collins, U. S. Navy, lelaim the shield, B, so hung or arranged upon a frame, C H and G, that it can be adjusted to the required angle with regard to the furnace door, sub-stantially as and for the purpose specified. The combination with the door shield, B, of the fender, A, when arranged together and so as to operate substantially as and for the purposes described.

61,402.-WHEEL AND AXLE CONNECTION.-Henry S. Cook,

Boston. Mass. DUSION. MASS. I claim the improved carriage wheel and axle connection consisting of the plates, a and e, with their studs, c c c, and openings, f f f, operating in com-bination with the collar, h, as described. I also claim, in combination with the above-described arrangement of parts, the pawl, i, or its equivalent, substantially in the manner and for the purpose as extorth.

61,403.— COVERING FOR THE HEAD. — Edwin Copleston,

Wrentham, Mass

f claim a head covering produced as herein described as a new article of manufacture. 61,404.—Extracting Iodine from Sea Water.—Rene Cup-

per, New York City. I claim the process substantially as herein described, for the purpose speci

61,405.—WASHING MACHINE.—Chas. Daniel, Lamont, Mo

01,400. — W ASHING MACHINE. — Chas. Daniel, Lamont, Mo. First, Iclaim the combination of the adjustable slotted cylinder, G, and the adjustable slotted concave frame, G, with each other and with the box or hub, A, when said cylinder and frame are constructed and operated substantially as herein shown and described. Second, The clamping device formed by the combination of the movable jointed frame, J, with the concave frame, G, substantially as herein shown and described and for the purpose set forth.

61,406.—BOAT-DETACHING TACKLE.—Wm. A. Devon, Port Richmond, N. Y.

I claim the combination of the jaws, A and B, of the pivoted locking clasp C, with its cam-shaped lever, h and cheek or face piece, i, for operation of the jaws, substantially as specified.

61,407.—FILTER.—Justus Doering, Philadelphia, Pa. First, I claim the perforated vessel, B, and its pipes, c and d, in combination with the casing, A, and its pipes, f and g, the whole being constructed and ar-ranged substantially as specified. Second, An inclined discharge pipe, arranged in respect to the concave bottom of a filter, substantially as and for the purpose described. Third, The pipe, d, with its openings, i, in combination with a filter, sub-tantially as and for the purpose set forth.

61.408.—GANG PLOW.—J. H. Douthit, Albany, Oregon.

61,408.—GANG PLOW.—J. H. Douthit, Albany, Oregon. First, I claim the attaching of the plow beams, F F, to slides, H A, fitted between suitable guides, c C, at the inner sides of the bars, A A, in connection with the foot lever, I, attached to one of the slides, H, and the pin, K, passing through any of a series of holes in the other slide, H, substantially as and for the purpose set forth. Second, The windlass, L, having the cords or chains, M M', attached, and the latter connected to the plow beams, F F, to operate in the manner sub-stantially as and for the purpose specifieo. Third, the windlass, K, having a cord or chain, A, attached, which is con-nected to the plow beams, F F, one of the bearings of the windlass being fitted in a slide, S, and having a pulley, V, on one end, around which and a pulley, W, on wheel, D, a beit, fi, passes in combination with the lever, T, attached to slide, S, all being arranged to operate in the manner substantially as and for the puppose set forth.

61,412.—Device for Changing Water into Steam Gen-

ERATORS.—Thomas F. Field, Saugerties, N. Y. I claim the valve, D, applied to and in combination with the change wat ed nozzle of steam bollers, and operating in connection with a feed pipe use under pressure, substantially as and for the purposes herein set for the 61,413.—KNITTING-MACHINE NEEDLE.—Levi W. Fifield, Mel-

rose, Mass. I claim the closer or latch, as made furcated, and with one or moreshoulders, d, arranged with respect to the forkas and for the purpose setforth. I also claim the pivoted closer or latch, as made with the slot, f, to enable it not only to turn upon but slide on its pin, e, as set forth.

61,414.-GLOBE VALVE.-C. L. Frink, Rockville, Conn.

I claim the attachment of the disk, H, to the stem, B, by means of the pin which is fast in the stem, and working in a groove in the disk as herein shown and described. 61,415.-CHURN.-Stephen M. Golden, Marcelline, Ill.

01,415.— Oth URN.—Stephen M. Golden, Marcelline, III. First, I claim the arm, D, as operating on the wrist, G, shaft, B, and adjust-able bolt, F, as herein described, and for the purposes set forth. Second, I also claim the construction of the frame, C, with its toothed wheels, K and L, fly-wheel, H, and adjustable piston, D, in combination with the shaft. B, and churn, A, when arranged and operated as herein described and for the purposes set forth.

61,416.-AUTOMATIC TOY.-William F. Goodwin, Washington, D. C.

ton, D. C. I claim constructing the legs of toys or hobby horses, with bars or pieces joining them together, making hinged or vibrating joints at the several points where the legs are required to bend so that when attached or pivotad on the studs, S, or their equivalents on the shoulders and high, and acting by the rotating of the cranks, B', the legs are made to move, bending all the joints, raising and turning the foot, stepping, walking, and trotting with both the foreard hind legs and feet, in imitation of the novements of the horse or animal which the toy is made to represent, in the manner and for the pur-pose substantially as described. Second, The cranks, B', or their equivalents, operated in any manner or by any means whereby they can be made to rotate; the rotating of which im-parts to the legs their vibrating and reciprocating motions, arranged to oper-ate in the manner and for the purpose substantially as described. 61.417,-DIRECTOR FOR UTERINE SUPPOPT -W C. Great

61,417.-DIRECTOR FOR UTERINE SUPPORT.-W. G. Grant

Wakeman, Ohio. Iclaim the director, A, made in two parts or sections, B, and connected to-gether substantially as and for the purpose specified. I alsocialm the pusher, E, in combination with the director, A, substan-tially as described, and for the purpose set forth.

61,418.— PEAT MACHINE. — Stephen B. Greacen, Norwich, Conn.

Conn. First, I claim the combination with the eccentric outer cylinder, B, and ir-regular cam, E, of the revolving inner cylinder, D, with its separately oper-ating radial slides, b, forming sides to the molds, the whole being constructed and arranged for operation together substantially as and for the purpose herein set forth. Second, The combination with the revolving cylinder, D, slides, b, and cam, F, of the knife or scraper, f, arranged for operation in relation thereto, as shown and described.

61,419.-Toy Gun.-Albert Hall, New York City.

First, I claim the construction of the stock of a spring toy gun, in two long-itudinal halves or sections, a b, secured together by the barrel, C, substan-tally as herein set forth, Second, The cylinifical india-rubber spring, g, arranged in relation with the piston, f, barrel, c, and trigger, k, substantially as herein set forth, for the purposes specified.

61,420.-Tool Holder for Planing Machines.-Charles

Hall, New York City. I claim the combination of the tool stock of a planer, with its support or rest, by means substantially as abov; set forth, so that t e tool stock can move a limited distance in two directions, in the line of cuttin, whereby two opposite cutting edges may be alternately brought into operation and held there.

61,421. - REVERSIBLE BUTT HINGE. - William Hancock Saco, Maine. Antedated Jan. 14, 1867.

First, 1 necified

Beedified. Second, I claim a double round edge hinge, as specified in combination with a movable pin or pintle, whereby I am enabled to obtain a "right or left hand " hinge movement from one and the same hinge. 61,422.-MACHINE FOR PULLING FLAX.-John Harrington

61,442.— WOOD TURNING LATHE.—John McMichael (assignor to Joseph Wright), Philadelphia, Pa.
First, I claim the rocking frame, H, arranged with the cutters, G and G', and the standing frame, A, substantially as hereinbefore described, and for the purposes specified.
Second, Combining the cam, V, with the rocking shaft, T, and rocking frame, H, for giving a reciprocating motion to the latter, substantially as and for the purpose sabove described.
Third, The combination of the cam-lever, O', with the centre, O', and lever, P, the latter being operated by the lever, Q, or its equivalent, substantially as and for the purpose set forth.
Fourth, arranging the sliding handle, Y, and spring, X, with the upright W, for the cam, V, and actuating the cam lever, O', through the intermediate levers, F, Q, substantially as described and for the purpose specified. 61,422.—MACHINE FOR PULLING FLAX.—John Harrington, Menomonie, Wisconsin. First, I claim the rotating reel provided with fixed radial plates, c, and movable plates, J, arranged so as to operate as clamps, and a: the machine is drawn along pull the standing flax and deposit it on the platform substan tially as set forth. Second The cam-shaped grooves, L, at the inner sides of the plates, M, and the pivoted arms, K, to which the plates J are attached, in connection with the rollers, e, at the inner ends of the plates, J, substantially as set forth. The shafts, J, at the outer ends of the plates, J, substantially as and for the purpose of operating the plates, J, substantially as and for the purpose specified. Fourth, The combination of the main frame and platform, with the reel arranged with clamps to operate as set forth.

61,423 — TRAVELING-BAG FRAME.—George Havell, Newark N. J.

I claim as an article of manufacture the within-described frame for travel ag bags, when constructed and used as and for the purpose specified.

61,442.—COPY HOLDER.—CHARLES B. MOSELEY and Lucius L. Woolley, Medford, Mass. We claim the cylinder, D, or its equivalent, having a spring jaw, F, when hung in a suitable frame, substantially as and for the purpose described. We also claim, in combination with the above, the swinging IId, H, arranged substantially as described, and for the purpose specified. We also claim the notched head of the cylinder, D, or its equivalent, in com-bination with the pawl or catch, N, for the purpose described. We also claim the iron frame on which the working portion of the machine rests, and which holds the same in position, substantially as specified. -MEAT CUTTER .- James L. Haven, Cincinnati, Ohio. 61.424.-61,445.—RAILWAY CHAIR.—Michael C. Murray, West Acton,

01,424.— MEAT CUTTER.—James L. Haven, Cincinnati, Onio. I claim the mode of securing an entire series of meat cutting or mincing knives, G, by means of a single set sorew, L, ribbed plate, F, and slotted case, A, B, substantially as set forth. Second, The provision of ribs, f, on the side of a meat cutter, whether cast on the case or separately, in combination with a correspondingly ribbed loose part, when arranged so that one lateral movement will firmly hold all the knives substantially as set forth. Third, The mode of securing a series of meat cutting or mincing knives, G, by means of the lateral movement of a ribbed plate, F, against correspond-ing ribs on the slotted case, A B, substantially as set forth.

61,425.—Apparatus for Automatically Weighing Spir

ITS AND OTHER LIQUORS .- Samuel K. Hawkins, Lan-

ITS AND OTHER LIQUORS.—Samuel K. Hawkins, Lan-singburgh, N. Y. I claim the automatic weighing machine, constructed and operating sub-stantially as and for the purpose herein described. Second, In combination with the levers, D and C, and the clutch hooks, p. p. I claim the drop weight, F, so arranged that the clutch hooks will alternately lift and drop the weight substantially as and for the purpose described. Third, The combination of the balance levers, D and C, with the mechanism for operating the valves, a, and b b, substantially as described. Fourth, The combination of the balance lever, D, the gripping bars, G G, the clutch hooks, p. p. the weight, F, and the V-shaped slot, V, constructed and operating substantially as described. Fifth, The dial plate, M, in combination with the index, m, the ratcher wheel, N', the pawl, n, and the arm, O, operated by a rock shaft substantially as and for the purpose described. Sixth, In combination with the balance lever, C, and its attachments, I claim the sliding weight, D', substantially as and for the purpose described. Seventh, In combination with the lower lever, C, and the drop weight, E, I claim the elastic platform, E', substantially as and for the purpose described.

cribed. Eighth, In combination with the lower lever, C, the connecting bars, H and h', and the valve, a, I claim the inclines, J and J', constructed and oper-ating substantially as and for the purpose described.

61,426.-REVOLVING SLUICE FOR SAVING METALS.-T. D. and

61,426.—KEVOLVING SLUICE FOR SAVING METALS.—1. D. and W. A. Hedger, Meadow Lake, Cal. We claim a sluice with revolving belt, D, so constructed that the sides will form flexible joints, b b, in passing around the drums, closing up and forming close joints while passing and down the incline, forming a sufficient channel between them for the purposedescribed, substantially as set form. Second, The mouthplece of opening, G, beneath the platform, so that the sand or pulp which is fed to the machine may enter a sufficient distance be-low to give the action and force to the water introduced through the open-

61,449.-BRICK KILN.-L. R. Norman and W. F. Dieterichs, Jr., St. Louis, Mo. We claim, First, Constructing the sides of our improved brick kiln of double

Mass.

61,432.—BURNER FOR VAPOR STOVES.—R. L. Howell (assignor to himself, E. M. Wilkins and W. S. Browning),

FEB. 9, 1867.

Signor to filmsen, E. M. Wilkins and W. S. Browning, Baltimore, Md. First, I claim the residuum chamber, N N, and the pipe, B, arranged sub-stantially as described, in combination with a vapor stove. Second, The conical headed pin, H, within the aperture, J, of the retort, operated by theserew pilor, E, substantially as and for the purpose specified. Third, The retort, F having stands, L, and partition, K, cast solit there-with, the latter having vent, J, extending through it, and valve seat, I, on its side, as and for the purpose specified.

61,433.-WINDOW SASH AND FASTENER.-Anthony Iske, Lan-

caster, Pa. I claim the tongue and groove connection of the strip, B, with the sides, A of the sash, in combination with the turning button, for either locking both parts, A B, together, so as to move up and down jointly, or for locking both to the casing, the whole arranged and operating in the manner and for the purpose specified.

61.434.—Steamboa't Signal Apparatus.—Patrick Kenny.

51,454.—STEAMBOAT SIGNAL APPARATUS.—PARTICK KENNY, New York City. First, I claim the combination of the signal handles with each other in the nanner described, so that each signal handle will have a different line of Second At standing the purposes set of the index shaft at intervals pro-ortioned and corresponding to the intervals between the signal marks upon he dial, substantially as described. Third, the combination of one or more levers, G, or their equivalents, with he index beft supretantially as described.

Third, the combination of one or more levers, G, or their equivalents, with the index shaft, substantially as described.

61,435. — APPARATUS FOR TETHERING ANIMALS. — Daniel

Kidder, Franklin, N. H. I claim the spring, E, applied to the pole, D, in combination with the stake substantially as and for the purpose described.

61,436.—CHURN.—Norman S. Kinyon, Chenango Forks,

I claim the combination, construction and arrangement of the dasher blades or floats, with the angular blades, s s, on the lower end of the shaft, B, sub-stantially as described and for the purpose set forth. 61,437.—RAILROAD SWITCH.—George T. Lape and Jephthah

We claim the street car replacer, consisting of the side pieces, B B, groove A, lug, a, when constructed and operating as herein set forth for the purpose specified.

61,438.-COTTON CHOPPER AND THINNER.-David P. Lewis,

Huntsville, Ala. I claim a machine for cutting and thinning cotton and for other purposes, constructed, arranged and combined substantially as herein shown and de-cribed.

61,439.—STOP MOTION FOR LOOMS..—Alphonse Julien Lois-

eau, New York City. I claim the oscillating plate, F, and cross bar, E, in combination with weights or rods, a, dog, e, catch bar, N, and stop, K, constructed and operating sub-stantially as and for the purpose described.

61,440.—Attachment for Holding Skirts Together.-Emile Loiseau, New York City. Iclaim a strap, A, whereby a lady's hoop skirt is attached to a petticoat saidstrap being made substantially as herein shown and described,

61,441.—BALANCE SLIDE VALVE.—Isaac V. Lynn and George I. Snowlen, Pittsburgh, Pa.

I claim the packing ring, D, or its equivalent, when used in combination with the cylinders, f and C, plate, B, and valve, A, constructed, arranged and operating substantially as herein described, and for the purpose set forth.

61,442.-WOOD TURNING LATHE.-John McMichael (assignor

61,443.-CALORIC RADIATOR FOR STOVE PIPES.-Benjamin

F. Miller, New York City. First, I claim the septa or plates, f, in combination with the diaphragm, e and radiating case, c d, substantially as and for the purposes set forth. Second, I claim atranging the diaphragm, e, and case, c, lin the manner shown in Figs. 1 and 3, so that the space through which the heated gases or products of combustion pass shall be nearly of equal area to the pipe, a, for the pur-poses and as set forth.

61,444.—COPY HOLDER.—Charles B. Moseley and Lucius L.

Mass. 1 claim the improved chair as constructed with the base plate, A, separate from and to extend under and support the jaw, C, as having the rebate, a, and as provided with the projections, c', and the shoulders, b b, arranged with respect to the base plate, A, and the jaws, B C, and so as to intend into and under the rails, as specified. I also claim the rails as made with the notches, d d, arranged in them at their joints or ends as specified and to be used with the chair made as ex valued.

also claim the nut holder, d, as made with the nut recesses, i i, and the nges, k, or their equivalents.

61,446.—BROOM.—Henry E. Newton (assignor to himself and W. A. Newton), Manchester, N. H.
I claim one or more springs, B, which connect the handle, C, with the broom head, A, substantially in the manner and for the purpose herein shown and described.

61,448.—BRICK KILN.—L. R. Norman, and W. F. Dieterichs, 61,445.— DRICK KILN.—L. R. HOIMan, and H. I. Foreston, Jr., St. Louis, Mo. We claim, First, The construction and arrangement of the smoke flues, D d D', as described and set forth. Second, We claim the cold air or supply chambers, C, with the distribution of the air to the furnaces through a series of orfices, c, as described and set

forth. Third, We claim the construction of the vertical walls of the kiln, with con-cave sides so as to resist the entire pressure from the expansive force of the heat and steam.

61,447.-PUMPS.-John Nicholson, Allegheny City, Pa.

for the purpose set forth.	ing, G, to sweep down the incline and carry with it the sand and debris, sub-	walls to enclose a hot air chamber when the outer wall is inwardly curved or
61.409.—SKATE.—Robt. E. Ellerbeck, Washington, D. C.	stantially as described, and for the purpose set forth.	scribed and for the purpose set forth.
First, I claim the laterally adjustable clips, a, attached to the skate on a	the debris down to the foot, as waste matter, as described.	Third, We claim also the arrangement of a hot air chamber, D, over the
line diagonal to the longitudinal plane of the blade, A, for the purpose of grasping and securely holding the boot or shoe when applied thereto sub-	61.427 - COMPOSITION FOR BOOFING - Cyrus Hill Dover	structed and operating substantially in the manner and for the purpose herein
stantially as shown and described.	Maine	specified. Third The combination and arrangement of the outer chimneys F the
second, The projection, o, having a groove formed therein and arranged to operate in connection with the plate n and secured by the catch e or its	I claim the composition for covering roofs, and for similar purposes, con-	valves, F' and the air chambers, A2 and D, enclosing the kiln, all substan
equivalent, substantially as set forth.	sisting of the ingredients herein named, and united in the proportions sub-	tially in the manner and for the purpose herein set forth.
rnird, in combination with the clips, a, arranged as described, I claim the grooved projection, o, and plate, n, spring, f, and catch, e, arranged to operate	61 400 Copy Hygener Levenh Himler Ol (1 17	extending entirely across our improved kiln, substantially or herein set forth.
as and for the purpose set forth.	1.420.—CORN HUSKER.—JOSeph Hindman, Olathe, Kansas.	61 450 CULTURATOR C P Norton Reserville III
61 410 MACHINE FOR CUMPING FUER Alfred B FLV News	the wrist, as herein shown and described.	First, I claim the pole, B, arch, C, and supporting wheels, D D, constructed
ton Mass	61.429.—BENCH VISE.—John S. Hoar, West Acton, Mass.	and arranged substantially as and for the purpose herein set forth.
First, I claim lining the socket and graping the tool in the stock or head	I claim the adjustable jaw, B, made as described I also claim its combin-	in connection with the plough beam. A, all arranged and operating as and for
with rubber, when the parts are arranged and constructed to operate sub-	ation and arrangement with the vise jaw.	the purpose described.
Second, Connecting the tool holder or head with the arm shaft substan-	its setscrew, b, with the vise jaw, A, and with the adjustable jaw, B, made as	61,451.—HAT BODY.—Julius A. Pease, New York City.
tially as described.	described.	I claim a hat or hat body male from raw or untanned hide, substantially
stantially as described.	61,430.—MUFF.—Charles Hollwede and Julius Brzezinsky,	as before described.
Fourth, The arrangement of the bars, G, with the head and arm, substan-	New York City.	61,452.—COT OR COVERING FOR ROLLS FOR SPINNING, ETC.—
Fifth, Regulating the angle of the cutting edge of the tool to the arm or	A fur muff having its ends turned and set upon a former, by means substan- tially as shown and described	Edward L. Perry, New York City.
shaft by means of bars and clamps, substantially as described.	61 431 SEED PLANMER D S Holmon Connecutatille De	or composed of three or more separate layers or thicknesses joined together
eling head, substantially as described.	I claim the 'two seed slides H H' placed one above the other at the upper	of which the outer layers, a and b, consist of leather and the intermediate
Seventh, The combination of the rubber-lined socket with the vertically swiveling and horizontally turning head substantially as described	part of the tubes, G, and having springs, d, bearing against them, in combina-	layer, c, of horous of elastic material, substantially as described.
of the DE Content of the Content of	ics all arranged to operate substantially in the manner as and for the purpose	61,453.—OIL TANK.—H. Pierce and J. C. Button, Cleveland,
61,411.—MACHINE FOR OPENING AND CLEANING COTTON.—	set forth.	Ohio.
Samuel Fay, Lowell, Mass.	arranged substantially as and for the purpose specified	We claim, First, The arrangement of the sills, B, keys, C, abutment brace
n the other, and revolved with the same or different velocities and in the	Third, The combination of the metallic tubes, L, and covering shares, U, all	Second, The construction and arrangement of the bottom, C', placed within
ame or opposite directions, substantially as shown and described,	stantially as shown and described.	the tank, the interlayer, d', in combination with the tank, H angle, "one, b, and floor G for the purpose and in the menner set forth
		- Mid us Sat foldes and harbon mar in any manual and market

61,454.—Combined Lamp, Coffee Pot and Boiler.—Luke

61,494.—COMBINED LAMP, COFFEE POT AND BOILER.—LUKE A. Plumb, Biddeford, Me. I claim, First, The tube, D, attached to a cone, C, of the burner of the lamp when used in connection with a vessel provided with a central draft tube to fit over said tube, D, substantially as and for the purpose herein set forth. Second, The employment or use in a vessel provided with a central draft tube for a lamp of a vessel, E, provided with two or more removable chamb-ers, J, substantially as and for the purpose specified. Third, The combination with a lamp of two or more vessels, E H, provided with central draft tubes arranged so that the draft tube of one vessel will ex-tend above fits top to admit of the lower end of the tube of the other vessel being fitte: upon it, substantially as and for the purpose set forth.

61,455.—CARRIAGE JACK.—Oscar T. Potter, Scott, N. Y. I claim the arrangement of the arm, b, with its fork, d, and crooked I m, in combination with the standard, a, when used as and for the purpor forth. 61,456.—CARTRIDGE FILLING MACHINE.—Timothy J. Pow-

City. I claim, First, The spring or contractible crimping die or device for closing the mouths of the shells on to or in the bulkt, constructed to operate substantially as described. Second, I further claim said contractible crimping die or its equivaient in combination with an internittent shell carrier for operation together, as es-sentially as here is efforth. Third, The combination of an automatic bullet feeder, with an automatic shell carrier, substantially as specified. Fourth, The combination of an automatic bullet feeder, shell carrier, and bullet feeder for action, together as here in set forth. Fifth, The combination with an automatic bullet feeder of a bullet, take up or slide to deposit the bullet over the shell. Sixth, In combination with an automatic bullet feeder, a divided or open-ing and closing conducting die to guide the bullet to its place in or over the shell and to hold it while the charge is being rammed, substantially as speci-fied. Seventh, Providing the bottom of the powder hopper or space intervening between it and he charge measures on distributed. ers (assignor to Fitch and Van Vechten), New York

field. Seventh, Providing the bottom of the powder hopper or space intervening between it and the charge measurer or distributor, with an independent bush and rubber packing, or their equivalents for operation together and in com-bination with the distributor, essentially as and for the purpose herein set forth.

bination with the distributor, essentially as and for the purpose herein set forth. Eighth, Griping the shell, while being crimped by an independent silde or its equivalent arranged to close upon the mouths of the shell chambers in the carrier and afterwards and retire therefrom, essentially as specified. Ninth, The combination in one machine of an automatic sell carrier bullet feeder, powder charger or measurer and distributor and crimping device or die (or operation together, substantially as herein set forth. Tenth, While not claiming irrespective of the modeherein described raising the shell at certain points within its chamber in the carrier, id o claim in combination with an intermitting rotating carrier provided with chambers, substantially as described the lifting rod, i, arranged to rase during a pause to retreat, essentially as and for the purpose herein set forth. Eleventh, Also elevating the upper end of the shell, prior to crimping above the top surface of the carrier and retaining it there while crimping by means of an intermittenity reciprocating rod, c, arranged to operate in connection with the carrier and suitable crimping device, substantially as specified.

61,457.-VISE.-James S. Ralston, Indiana, Pa.

I claim in combination with the A A, of a vise, the cam disks, C C, placed on a coupling rod, B, for opening and closing the jaws to be held to then work by the rathest wheel, c, and spring dog, e, constructed and operating substantially as herein described.

61,458.—BUTT HINGE.—Andrew Remkin, Philadelphia, Pa. I claim the roller, m, adapted to the two plates of a lift off hinge, substan-tially in the manner and for the purpose herein set forth.

61,459.-GLOBE CLOCK.-Smith E. G. Rawson, Saratoga

Springs, N. Y. I claim, First, Providing for the winding up of a globe clock through an perture in the shaft or axle of rotation of the globe within which the clock

aperture in the shart of all of rotation of the globe clock coincident with the sits of rotation of the globe within which the clock mechanism is contained. Third, Sustaining a globe clock upon an adjustable support, C, or its equivalent, substantially as described. Fourth, Supporting a globe clock by means of a vertical spindle upon a pedestal in such manner that the globe can be rotated about a vertical axis, but methy as described.

Fourth, Supporting a single field of the globe can be roused about a result of the substantially as described. Firth, The combination of a fixed index, k, and movable index, n, with a globe which is rotated automatically, substantially as described. Sixth, Sustaining a globe which is rotated by means of clockwork upon a tubular shaft, in such a man ner that the clock spring can be wound up without a stating the globe. Bubstantially as described.

61,460.—DENTAL PLUNGER.—William G. Redman, Louis

villed, Ky, First, I claim the casing as represented in form by A and A', containing the bar, D D', the let-off bar, f, the spiral spring, h, the spring and stop, z and the disks, V and V', the partial disk or joint piece, w, and the swivel joint, E, constructed substantially as described for the purpose specified. Second, I claim the arm or lever, C, connected with the spring helve by slot and holt, substantially as described. Third, I claim the spring helve, I, and its connection with the case at 11, and also the spring, d, acting against the helve. Third, I claim the spring helve, I, and the connection with the case at 12, and also the spring, d, acting against the helve.

61,461.—CAR TRUCK.—J. W. Reynolds, Hyde Park, Pa., as-

bit Action -- CAR TRUCK.--J. W. Reynolds, Hyde Fark, Fa., assignor to himself and S. H. Cutler.
 I claim, First, The construction and arrangement of the pivot or king bolt, D, of the truck on a socket, C, applied to the cross bar, B, substantiaily as and for the purpose set forth.
 Second, The combination and arrangement of the springs, I, bars, G, and the boxes, F, substantially as and for the purpose specified.
 Third, The openings, d, in the outer sides of the boxes, F, in combination with the slides, e, substantially as and for the purpose set forth.

61,462.-VALVE GEAR FOR DIRECT-ACTING ENGINES.-M. S.

61,462.—VALVE GEAR FOR DIRECT-ACTING ENGINES.—M. S. Richardson and Erasmus A. Pond, Portland, Vt. We claim, First, The piston valves connected with and directly actuated by a system of levers operated by the steam piston as herein described, so as to effect the induction and eduction of steam to and from the steam cylinder Second, The combination of the piston valves with an oscillating lever actuated by auxiliary levers arranged within the steam chest and cylinder, substantially as shown and set forth. Third, The combination with a system of levers located within the steam chest and cylinder and actuated by the steam piston as described of the cyl-indrical plangers or piston valves silding in recesses formed in the steam chest on each side of the central steam admission and exhaust chambers. substantially as herein shown and specified.

61,463.-EXTRACTING OIL FROM SEEDS.-John Robertson, Brooklyn, N. Y., assignor to himself and Abraham Bart holf.

I claim, First, The process substantially as herein described of treating seeds or other substances for the extraction of oil by subjecting the same to the action of beaters in a heated cylinder or case, essentially as herein se

the action of beaters in a heated cylinder or case, essentially as herein set forth. Second, The within-described process of extracting the oil from seeds or other substances reduced to a pulp by exposing the same to the action or a centrifugal machine, substantially as specified. Third, The combination with a centrifugal machine of revolving beaters working in a cylinder or case as described and to which steam is or may be admitted for separate or joint action on the material from which the oil is to be extracted, essentially as specified. Fourth, The arrangement in a loose or detachable manner within the re-volving cylinder or holder of a centrifugal machine and so as to rotate with slad holder of the reticulated cylinder or screer, in which the material is placed for action, as described.

61,464.—PEAT MACHINE.—Almon Robertson, McLean, N. Y.

61,464.—PEAT MACHINE.—Almon Hobertson, McLean, N. Y. First, I claim the carriage molds, a a, arranged relatively the each other and to the grinding and depositing mechanism, DI D2, or their equivalents, substantially as and for the purposeherein set forth. Second, I claim the presser, G, in combination with the carrier molds, a a, and arranged to operate relatively, substantially as herein specified. Third, I claim the slack cloth, g, arranged on the presser, G, so as to be pulled off by a motion commencing at the edge or edges, as represented and described for the purpose herein specified. Fourth, I claim the slack cloth, M, arranged as herein shown relatively to the section of molds, a a, so as to unfold, peel off and expel, in the manner and with the effect substantially as herein specified. arra Third, pulled of des

holding the background and likeness on separate and divergent planes, sub-stantially as and for the purpose described. Third, The combination of parallel wheels revolving independently around the same axis, for the purpose of changing the grouping and scenery of the pleture, and bringing different figures in juxtaposition successively, substan-tially as set forth.

16,470.—PLOUGH.—Israel Long, Terre Haute, Ind. First, Iclaim the adjustable beams, F F, occupying positions at opposite sides of the machine and outside of the wheels, and each adapted for the at-tachment of one or more ploughs, substantially as and for the purpose herein specified.

Second, I claim the combination with the ploughs, substantiarly as and for the purpose herein Second, I claim the combination with the ploughs, G G', beams, F F, of the collars, E E, litted to turn upon the ends of the axle, and adjusted by means of levers or otherwise, as and for the purpose specified. Third, I claim the combination of the plough beams, F F, collars, E E, lev-ers, H, and notched bars, I I, all arranged and operating in the manner and for the purpose herein set forth. Fourth, I claim the adjustable double-tree, K, in combination with the in-dependent hounds, D D', whereby the draft may be transferred to either side of the machine, substantially as and for the purpose described.

61,471.-MACHINE FOR SEPARATING IRON FROM SAND.

George H. Sanborn, Boston, Mass. I claim the use of the cylinder, B, when provided with the magnets, g g, one or more rows arranged substantially as and for the purposes described, in combination with the brush, C, the hopper, D, the spout, E, the trough, F, and the drawer, J, substantially as and for the purposes set forth.

61,472.—EMBALMING BODIES.—George W. Scollay, St. Louis, Mo.

MO. First, I ctaim embalming dead bodies or preserving them from putrefac-tion, by introducing an antiseptic gas or gases into the arterial or vascular system, substantially as described. Second, Embalming dead bodies or preserving them from putrefaction by the introduction of an antiseptic gas or gases into the bowels, stomach, or lungs, substantially as set forth. Third, Embalming dead bodies or preserving them from putrefaction by combining the internal and external application of the gases thereto, sub-stantially in the manner described.

61,473.-CLOTHES DRYER.-John Seeman and Silas P. Ca-

trow, Middletown, Ohio. We claim, in combination with the hinged frames, B, the frame, E, hung hereto and locking together, substantially as described for the purpose positied

61,474.—PETROLEUM STILL.—John S. Shapter, New York

61,474.—PETROLEUM STILL.—JOHH D. DHapter, Item Form City.
First, I claim the arrangement of the boller superheated and still, by which the heat from the boiler is made to pass through the superheated, and then through under and around the still.
Second, The arrangement of the furnaces, L L, colar, C, and dampers, N N N, in combination with the coil, F, for superheated steam within the still.
Third, Inclosing a petroleum still in brick work with two side channels, one above and the other below the collar, c, and a third be neath the still, so b-stantially in the manner and for the purpose described.
Fourth, Placing the eyeglass, Q, in a tube connected with the still, so that the operation within the still can be seen, although enclosed in brick walls with channels forsmoke and hot air between the masoury and the still.
Fifth, The air pipe, S, when applied to a petroleum still for regulating the vacuum.

61,475.—RAILROAD SWITCH.—Benjamin Shiverick and Thos.

L. Calkins, Philadelphia, Pa. rst, We claim the switch lever, I, contained within a building or inclos-and arranged in respect to the door of the same substantially as set Firs

forth. Second, The combination and arrangement of the frog rails, D and D', and switch rails, E and E', the bar, H, with inclinations, x and y, yielding plates, G and J, and rods, F and K, the whole being arranged for joint action, sub-stantially as and for the purpose herein set forth.

61,476.—CRANBERRY GATHERER.—George Shove, Yarmouth-

Dort, Mass.
 I claim the combination as well as the arrangement of the guard wires or guards, c, with the inclined combor series of wires, b b.
 I also claim the combination as well as the arrangement of the guards, c, the inclined comb and the trough, B.
 I also claim the combination as well as the arrangement of the side plates, a, the comb, b b, the guards, c c, and the trough, B, the whole being substantially as hereinbefore explained.

61,477.—BUCKLE.—Earl A. Smith, Waterbury, Conn. I claim the combination of the bow part, Fig. 4, with the lever part, Fig. 3, when they are constructed, connected and fitted for use substantially as herein described and set forth.

61,478.—GRIDDLE OR COOKING UTENSIL.—E. J. Smith, Wash-

ington, D. C. I claim as a new article of manufacture the cooking utensil herein de-scribed, composed of plates, B B, removable rests, a a, and support, A, sub-stantially as and ter the purpose set forth.

61,479.-TRANSPLANTING TRAY.-Wm. W. Smith, Montrose,

Pa.

Γα. I claim a plant tray constructed substantially as described for the propoga tion and growth of plants and flowers, as herein set forth. 61,480.-MACHINE FOR COMBING AND ASSORTING BRISTLES.-

tion and growth of plants and flowers, as herein set forth.
61,480. — MACHINE FOR COMBING AND ASSORTING BRISTLES. — Nathan H. Spafford, Baltimore, Md.
First, 1 claim the endless apron and feed roller, E e, with the ploker, E', on the shaft, F, having a continuous motion as described, in combination with the intermitting endless apron and feed roller, E' e', operated substantially as herein set forth, for the purpose described.
Second, The comb, J, with its appurtenances, consisting of the comb stock and teeth stem, J', gage plate, K, arms, K', and spring, 1, all combined sub-stantially as and for the purpose set forth.
Third, The manner of operating the comb, J, by means of the shaft, g, and rank wrist, I, in combination with the sliding stem, J', and its socket and with the adjustable joint, K, and cams, m m, substantially as set forth: and tills I claim whether the intermittent motion of the comb be derived from the action of the segment, H, in the pinion, h, or from any equivalent device, Fourth, The comb, J, and its appurtenances, in combination with the gage plate, M, operated by means of the rock shaft, L, stud, n, and toe, n', or their equivalents, substantially as and for the purpose herinbefore set forth.
"fifth, The jaws, O, furnished with one or two yielding lips, and the levers, O' O', in combination with the cams, R, and springs, and either with or without the toggle-joint levers, q q, all combination with and operated by the tumbler, t, slotted bar, t', and chains or any equivalent, substantially as and for the purpose described.
Seventh, The endless platform, u u, arranged substantially as described, and having an intermittent motion in combination with the endless apron, W, over the deposit box, W, ior the purpose set forth.
Eighth, The sweeping fingers, X' z', operating as set forth, and by means substantially as described, in combination with the endless apron, W.
over the deposit box, W, ior the purpose set fort 61,500.—LIFE BOAT.—William H. Wylly, Savannah, Ga. Iclaim the boat consisting of the gutta percha or elastic sides, A B, keel, C', copper covering, b, flexible tube, c, force pumps, D, bars, I, seats. J, support-ing pars, if', rudder, D, when all are constructed and arranged as herein set forth and for the purpose specified.

arranged and operating substantially as and for the purpose set forth.
61,481.—STREET CAR.—John Stephenson, New York City.
First, I claim the pedestals, B, formed or provided with pendant jaws, a, in combination with springs, D, located at each side of the axle box, and applied or arranged in such a manner as to admit of an universal motion or pendulous vibration of the car body, substantially as abown and described.
Second, The inverted T, connecting the lower ends of the jaws, a a, of the pedestals and arranged or applied in relation to the axle boxs, substantially as and for the purpose set forth.
Third, The truck, M, constructed with its horizontal side bars not under the springs or pendants, but at the sides thereof, and free therefrom, and connected with the axle boxes, cor the housings, G, by me ans of the arms, N, substantially as described.
Fourth, The voke, or housing, G, with one or beth of the arms as described and applied to the axle boxes, C, either with or without the elastic substance, b^{*}, substantially as and for the yokes or housings, G, substantially as and for the purpose set field.

rod. V, hung to an adjustable arm, W, of the crank arm, Y, at one end of the shaft, Z, substantially as and for the purpose described. Second, The combination with the file bed, or block, of the notched plate, K, for receiving the tang of the file, and side clutches or jaws. Lor M, each arranged and applied to the said block, so as to be operated substantially as and for the purpose described. Third, The springs, O 2, constructed and arranged as described in combin-ation with the lifting beam, D 2, and ecc. mtrie or cam pulleys, T 2, ubstan-tially as and for the purpose described. Fourth, The combination with one or more of the springs, O 2 of the lift-ing arm, W 2, arranged with regard to the same as and for the purpose speci-field the attached to the same as and for the purpose speci-

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field. Fifth, The arm, f 4, attached to file carriage, D, in combination with the lever, g 4, connection rod, h 4' catch, 1 4, and m 4, and no tched arm, c 4, of the beam shaft, O 8, when all arranged and connected together so as to be oper-ated by the arm, f 4, substantially as described, and for the purpose specified. 61,487.-Boot or Shoe.-Rudolph Vollschwitz, New York

City. I claim the combination of a flexible wedge, B, with zig-zag loops, a, at-tached to the opposite edges of the slit or opening in a shoe or gaiter boot, substantially as and for the purpose described.

61,488. - CORK EXTRACTOR. - James Walker, Cincinnati,

Ohio. — OURN EXTRACTOR. — James Walker, Cincinnati, Ohio. First, I claim the arrangement of adjustable gnide, E, cylindrical stock, E, collar, I, crank, H, and cam headed lever, J J'K, for the purpose set forth. Second, The provision, in combination with the above, of the thimbles, I, of equal external but dissimilar interior diameters, as and for the purpose ex-plained.

61,489.-MACHINE FOR CUTTING SOLES.-J. H. Walker. Wor-

cester, Mass. First, I claim the combination and arrangement of the broad table, D, for supporting the side of leather with the adjustable bed or cutting block, L, and the reciprocating platen, K, substantially as and for the purposes set

Second, The combination and arrangement with the table, D, bed, L, platen, Second, The combination and arrangement with the table, D, bed, L, platen, K, and shaft, J, of the peculiarly constructed frame composed of the parts marked E H H, and G, substantially as described.

61,490.—HAND CORN PLANTER.—Lewis Weaver, Canton,

Ohio. I claim the bar, L, in connection with the valve standard, C, and opening, N, substantially in the manner and for the purpose specified,

61,491.—RAILROAD CHAIR.—Geo. Webb, Williamsport, Pa, First, Iclaim the joint plate, A. resting on the ties, C. in combination with the flanged clamp, D. and rail, B. constructed and secured in the manner as and for the purpose specified. Second, The combination of the joint plate, A. flanged clamp, D. gibs, d, split keys, e, as and for the purpose specified.

61,492.—PUMP.—J. R. Weisiger, Danville, Ky. Iclaim the pump cylinder or tube, A, provided with a piston, B, partition plate, D, and valve, G, in combination with the tubes, H J L, having valves, IK M, respectively, when all arranged with regard to each other so as to operate substantially in the manner and for the purpose described.

61,493.—PEAT CAR-Thomas J. Wells, St. Anthony, Minn. I claim a car for transporting and drying peak, constructed with a series of frames, arranged substantially in the manner as herein shown and described. 61,494.-CHURN AND EGG BEATER COMBINED.-George C.

Westover, Paducah, Ky. I claim the construction and combination of the churn, with its devices, G H I J L M, as herein described and for the purposes set forth.

61,495.-LIME KILN.-George W. White, Greensburg, Ind.

I claim the horizontal taper lime kin. A, when constructed as described, and provided with the doors, b, and dividing perforated partition, c, in the namer and for the purposes set forth.

61.496.—WASHING MACHINE.—Isaac Whitney, Dayton, Ohio. First, I claim the hinged scaping box, 1, with its bars, n n, and removable trough, L, adapted to contain either bar, or toft scap, substantially as described.

Second, The combination of the brush roller, F, with the corrugated wooden Second, The combination of the brush roller, F, with the corrugated wooden roller, E, substantially as described. Third, In combination with the brush roller, F, and corrugated wooden roller, E, I claim the treadle, k, substantially as and for the purpose set forth. Fourth, The arms, C, operating independently of each other by means of the elastic bands, D D, in combination with the corrugated roller, E, in the manner and for the purposes described. Fifth, The combination of the corrugated wooden roller, F, brush roller, F, treadle, k, gear wheels, H c, arms, C, spring, D, and soaping cover, I, and trough, K and L, substantially as and for the purposes set for th.

61,497.-WINDOW FASTENER.-L. C. Wing, Concord, Mass.,

and A. R. Bradeen, Waterborough, Me. We claim an improved window blind fastener, formed by the combination of the arm, A, bars, B and C, perforated plate, D, and spring bolt, E, with ach other, substantially as herein shown and described and for the purpose

61,498.-CLOTHES DRYER.-Leonard Wordworth, Morrison,

I claim the braces, D.D. in combination with the standards, A A B B B B, nd bars, e e e e, substantially as and for the purpose set forth.

61,499.-Tool For Cutting off Boiler Tubes.-Nathan

Wright, Jersey City, N. J. I claima tool for outling of boller and other tubes, constructed substan-tially as described, or in any other equivalent manner, so that a thrusting cut is given to the tool, and whereby the same action that thrusts the cutter through the tube also serves to complete the operation of severing the same by a draw cut, essentially as specified.

REISSUES. 2,463.—SEALING FRUIT JARS.—Wm. H. Lyman, Boston, Mass., assignee by mesne assignments of Elbridge Harris.

Mass, assignce by mesne assignments of Elbridge Harris. Patented Feb. 9, 1864. First, I chain forming a groove or depression in or around the neck of a can, for the retention of an elastic ring or band impervious to air, substan-tially as and for the purpose described. Second, The employment of an elastic ring or band when used between the rim of a cover and the neck of a can, substantially as and for the purpose described. Third, I claim as a new article of manufacture, fruit jars composed of the rim cap, G G, elastic ring or band, D, and jar or can, D, substantially as and for the purpose described. Fourth, I claim the rebate formation, C, in combination with the elastic band, B, and the fiange, G'substantially as and for the purpose described.

2,464.—HARVESTER RAKE.—Adam R. Reese, Phillipsburg, N. J. Patented Feb. 16, 1864. First, In a floating beam harvester I claim a rake standard rigidly attached to and vibrating with the platform and supporting the rake shaft between the driving wheels. Second, I claim the combination of radial rake arms plyoted between the vertical rake shaft and the rake head, and a guide located between the rake shaft and the plyot.

We ricial rake shaft and the rake head, and a guide located between the rake shaft and the plvot. Third, The combination of revolving rake and reel arms with a camway between two parallel cams, for the purpose of keeping the rake and reel arms firmly in position while revolving. Fourth, The combination of a hinged platform, a support of the revolving rake rigidly attached to and moving with the said platform or finger beam and radial pivoted rake arms. Fifth, the combination of the rake shaft, K, with the driving shaft, o, by means of the endless chain, M, when arranged and operating substantially in the manner described, for the purpose of driving the rake in any position of its shaft without the intervention of gearing, as set forth.

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Fourth, I claim the slack cloth, M, arranged as herein shown relatively to	axleboxes, or with the yokes or housings, G, substantially as and for the pur-	2.465.—HARVESTER RAKE.—Adam R. Beese, Phillipsburg,
and with the effect substantially as herein specified.	pose specified.	N. J. Patented May 1, 1866.
Fifth, I claim the roller, I, arranged to pass into and out of the several	61,482.—ROOF FOR RAILROAD CAR.—John Stephenson, New	I claim, First, In a harvester having a hinged cutting apparatus, the com-
molds and replace the slack cloth, M, or its equivalent, in the manner herein	York City.	bination of a revolving rake and reel attach. d to and vibrating with the plat-
61 APE Assistance Tuon A Dahingon In Son From	First, I claim the canopy, D, for the covering of the platforms of cars con-	whole so arranged and operating that the rakes shall not revolve over the
ol,400.—AMALGAMATOR.—Juan A. Robinson, Jr., San Fran-	substantially as and for the purpose specified.	driver.
CISCO, Cal.	Second, The smaller canopy or "frontlet," F, applied to the ends of the car	Second, The combination of a hinged cutting apparatus, a driver's seat on the main frame and hinged radial rate or real arms
conne. with frictional surfaces, substantially as and for the purposes de-	forth	Third, The combination of the finger beam and main frame with the tubular
scribed,	61.483.—Sounding Board for Planos.—F. Strothmann.	X-shaped frame, G G', as described, for the purpose of supporting and brac-
61.466.—MANUFACTURE OF SOAP.—George W. Rogers, Lan-	Louisville, Ky., assignor to Peters, Webb & Co.	Fourth. The combination of a revolving rake and reel attached to and mov-
caster, N. Y., assignor to himself and John D. Shepard.	I claim the improvements in sounding board for pianofortes and other mu-	ing with the platform of a hinged finger beam machine and endless chain and
I claim the within-described manufacture of soap by subjecting the ma-	sical instruments herein specified, the same consisting inseparating or divid-	driven while it is free to rise and fall with the platform.
terial to a high pressure at a moderate temperature, substantially as and for	ing the board, substantiany as and for the purpose specified.	Fifth, The combination of an endless driving chain, a pulley on the main
of A07 Ourses Ourse Adultus Dave Dath N X	61,484.—CAN OPENER.—Sinius E. Totten, Brooklyn, N. Y.,	and rake shaft mounted on the finger beam or its extension and the interme-
1,407.—CARPET SACK.—Auanne Rose, Dath, N. 1	assignor to himself and C. L. Topliff.	diate guide for guiding the chain, between the main shaft and rake shaft.
keepers, C, as and for the purpose specified.	a pointed tooth, d. substantially as and for the purpose described.	
61 468 — PUMP — John Ross Greenville Mich	61 485 COBE SCREW - William H Van Gieson Passaie	DESIGNS.
First. I claim the arrangement of the bore B. bores. F F. chamber. C.	N T	2560 - COAL SHOVEL - Samuel W. Gibbs Albany N. Y.
chambers, L M, and piston rods, P R, secured to racks, S T, in combination	IN. J. First Lolaim constructing the upper part B of the stem in the form of a	9501 The set Man Annual Heidelberger New York
scribed for the purpose specified.	twist, spiral or screw, turned in a direction the reverse of that of the lower	2,301. — TRADE MARK. — August Heidelberger, New York
Second, In combination therewith the vent tube, X, of the chamber, C, and	part, A, substantially as and for the purpose set forth.	City.
notched rod, A', arrange to operate substantially as and for the purpose	described, of the tube, E. plate, H. or its equivalent spring catch, I, and	2,562 and 2,563.—CLOCK CASE.—Nicholas Muller New York
61 460 MODE OF MOUNTAINS DROTOGRAPHIC FOR FURTHER	handle, F, the whole working together in the manner and to accomplish the	City.
01,409.—MODE OF MOUNTING THOTOGRAPHS FOR EXHIBI-	result set forth.	2.564 and 2.565.—CASTER FRAME.—Horace C. Wilcox (as-
TION.—Isaac Rowell and Francis E. Mills, San Francisco,	61,486.—MACHINE FOR CUTTING TILES.—Charles Vogel, New	signor to the Meriden Britannia Company), West Meriden,
Ual. First We claim amonging on mounting shotseness hiltersees and	York City.	Conn
divergent from the plane of the background and foreground substantially as	First, I claim the sliding carriage, D, for the fileblank, arranged to move	
and for the purposes herein set forth.	ated through a driving shaft, O, gears, P2, and Q-shaft, R, having ratchet	NOTE.—In the above list of patents we recognize FORTY-SEVEN cases which
second, we claim the picture trame or case, A, with the sloping back for	wheel, S, with which engages a pawl, T, that is operated through a pitman	were prepared at this officeEDS.

Scientific American.

[Feb. 9, 1867.

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the spindle by a sleeve in a manner similar to the ordinary way of attaching the hour hand. The minute hour spindle has attached at the rear of the face plate two cams, C, the outer one of which gives a reciprocating movement to a long lever, D, and carries a shorter onejaw seen at E-which is pivoted at F, and has a projecting pin, G, that engages with the teeth of the wheel, A.

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by watch tinkerers. It is the subject of a patent obtained | which are the product of the fancy, and we find among the March 13, 1866, by Hoban J. Holden, of Genoa, N. Y. He will list, pumps with one bucket and those with two in the same by home tinkerers, this loss would not be felt except as dimin chamber; pumps with and without valves; those with valves ishing vexation and annoyance.

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