greens, but will extend them along the highways, and make property.

Is it a New Element?

Dr. George A. König, of the University of Pennsylvania, recently announced the discovery of what he thought to be a new metal. If this proves true, America may have the honor of celebrating her centennial year by the discovery of a new element in a peculiarly American mineral. Dr. König states that in analyzing a mineral resembling schorlomite, brought from Magnet Cove, Arkansas, by Professor A. E. Foote, he obtained, in the place of titanic acid, a white oxide which differed from the former very materially. Inasmuch as Dr. König does not tell us wherein these differences consisted, we can scarcely form an opinion on the blast furnace was found to be very troublesome, and, as the probability of this being the oxide of some new metal. The greater portion of the zinc was entirely lost, was by no means in the shape of market lead in 30 hours from the time it is oxide of titanium is itself white, when pure, and possesses many remarkable properties, such as existing both in a soluble and insoluble form, of passing from the former to the latter condition simply by continued boiling, of passing gradually into that state by standing, that it is precipitated pure by the zinc by distillation. This is the process now in use, and large scale. An analysis of the market lead gave antimony ammonia in the presence of sulphurous acid, sulphureted known as the Flach-Guillem process, and which is carried on hydrogen, or other reducing agents. The numerous forms at the Clyde Leadworks in the following manner: About 18 in which it appears, and its protean changes, would be likely tons of rich lead, containing generally from 60 to 70 ozs. of to deceive a less experienced chemist than Dr. König, who silver per ton, are melted in a large cast iron pot, 1 per cent due the finer quality of the products manufactured from it. has already discovered one new mineral, a hydrated oxide of titanium, to which he gave the name of hydrotitanite.

In M. Mendelejeff's remarkable prediction of the discovery of gallium from a mathematical comparison of the atomic a solid ring or crust, containing the silver and other foreign weights of the known elements, he also predicted the dis- metals. This alloy is removed to a small pot at hand, where covery of another element to which he gave the name of part of the lead is sweated out, and the alloy thoroughly eka-silicon, or eka-silicium, having its place between silicon dried. The large pot, with the lead now partially desilverized, and titanium. Perhaps Dr. König has discovered eka-silicium

will be obtained, says he, from its oxide EsO_2 , or the potas- addition of $\frac{1}{4}$ per cent of zinc is found necessary to take out sic fluoride EsK₂, F₆, by means of metallic sodium. The the remainder of the silver, care being taken on the cooling metal will decompose steam with difficulty, acts feebly on of this zincing that all the crystals are cleanly skimmed off. acids, more easily on alkalies. It will be a difficultly fusible The lead in the large pot is assayed, and found almost always metal of a dark gray color, which when ignited is converted into an oxide, EsO₂, which fuses with difficulty. The speci- should happen to contain more, it is due to carelessness on fic gravity of the oxide will be 4.7. It will resemble in external appearance, probably also in crystalline form, in pro-lead run down into an improving pan, where it is kept at a perties and reactions, oxide of titanium, TiO₂. As the acid high heat for nearly eight hours, for the purpose of oxidizcharacters of the oxides of titanium and tin are feeble, although distinct, the new element will possess the same char- in it from the zincing process; after seven or eight hours' acters and be a stronger acid than titanic oxide. It will bear firing in this pan, it should contain no trace of zinc. It is the same relation to titanium as zinc to calcium, and as ar- then tapped and run into moulds for market lead or for the senic to vanadium; so its basic properties will be more feeble manufacture of lead products. The old improving pans than those of the oxides of titanium and of tin, but stronger were made of cast iron, placed on a bed of sand, with a than silica, SiO₂. We may expect it to form a hydrate soluble in acids, the solution being easily decomposed with the ash, to prevent the action of oxide of lead on the iron. These separation of an insoluble metahydrate. It will be more pans, from the giving way of the bone ash and the great wear easily separated from acid solution than TiO2, less easily and tear on the iron from the high heats necessary, were from alkaline solution. There is no doubt that it will form found to be both troublesome and expensive, being very with corresponding salts of silicon, titanium, zirconium, and tin, isomorphous double fluorides. The potassic fluoride will be more soluble than the corresponding silicon salt. The chloride of the new metal will have the composition Es Cl4, will boil at 212° Fah., or perhaps lower; its vapor density will be about 1.9 at 32° Fah. It will form, like silicon and tin, a series of volatile metallo-organic compounds, which will distinguish it from the chloride of titanium.

If Dr. König has not really discovered this expected metal, its discovery is not distant, for many of our American chemists are earnestly engaged in hunting it down, and with our vast mineral resources, and the Russian chemist's explicit directions of where and how to look for it, we anticipate speedy success.

Mendelejeff's remarkable prediction of gallium was the result of what he calls the periodic law. His table, from which he obtained his results, and the study of which will probably lead to many other interesting discoveries, having never before been printed in English, is given below:

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Group I

H=1

1

to decorate and adorn their homes and gardens with ever- | treatment of argentiferous lead with zinc, for the purpose of | and are all recovered. The lead from the slag hearth, which nary improving or calcining pan. The operation with the ver extracted as in the manner before described. economical.

> by weight of zinc is added, and the whole well stirred for 20 minutes. The fires are drawn, and the contents allowed to settle and cool until the zinc rises to the surface, and forms is again heated up and treated in the same way as before, but with the addition of only $\frac{1}{2}$ per cent of zinc, which when it to contain less than 5 dwts. of silver to the ton of lead; if it the part of the workmen. The pot is now tapped, and the ing or burning off the small percentage of zinc which is left groove in the upper sides, which groove was filled with bone

often under repair, and seldom lasting more than six or pan of cast iron, lined with brick inside. This pan, instead of being placed on a bed of sand as was the case with the old improving pan, is hung on brick walls, and is quite open both below and round the outside. This new pan has been don Times. working in the patentee's works, Marseilles, for some years, and at the Clyde Leadworks for the last eighteen months. without any breakdown. It burns no more coal, and can be as economically worked in every way as the old pans.

out into moulds; thence it is taken to the refinery, where it is tion of heat. cupelled in the usual way. The block of metallic zinc re-

VIII. Transition to group I.

extracting the silver and refining the lead, is by no means a contains a number of impurities, as copper, antimony, iron, or landmarks of them between all neighboring possessions and novel process. About 20 years ago a metallurgist named sulphur, is taken to the improving furnace-a furnace built Parkes took out patents for desilverizing rich leads by means in exactly the same way as the dezincifying pan. About 20 of zinc, and a manufacturing firm adopted his process. They tons of this lead are heated for a period generally from four were, however, subsequently obliged to abandon it, in conse- to five days, but the time varies according to the amount of quence of the difficulty experienced in the separation of the impurities present. The oxidized impurities as they are zinc from the concentrated silver, to admit of the cupellation formed float to the surface, and are skimmed off by the of the latter metal. A German chemist, named Flach, workman, who is made to keep the lead perfectly clean, so afterwards took up the subject, and by running the alloy of as to have a fresh surface always exposed to the action of zinc, silver, and lead, along with iron slag, through a pecu- the flame. The dross skimmed off is at first of a black color, liarly constructed blast furnace, was enabled to free the con- but gradually becomes lighter as the operation goes on, until centrated silver-lead from zinc. He also proposed the use of it shows nothing but yellow oxide of lead. When this apthis furnace for the removing of traces of zinc from the de-pearance is noted the pan is tapped into moulds or into the silverized lead, but this was abandoned in favor of the ordi- desilverizing pot, where it is treated with zinc, and the sil-

> By this process the lead can be desilverized and turned out put in process, the loss in working being not more than $1\frac{1}{4}$ M. Manes, of Messrs. Guillem & Co., Marseilles, who per cent. That all the silver is thoroughly taken out may were the first to work Flach's process, found out and pat- be seen from the fact that there is an excess of silver, to the ented a simple means of treating the alloy and recovering extent of nearly 2 per cent, over the assays obtained on the 0.0015 and silver 0.0004 per cent, a trace of copper, but no iron or zinc, from which it will be seen that the lead refined by the zinc process is almost chemically pure, and to this is

----An English View of American Manufactures.

It is incumbent upon the manufacturers of the United Kingdom to show the world at Paris next year that they have not fallen behind the position they once occupied. The competition at Philadelphia was not altogether satisfactory to us.

It is true that every nation has an advantage in exhibitions held within its own area; but the products of the industry The new element, which Mendelejeff called eka-silicium, has risen to the top is removed as before and dried. A third of the United States surpassed our own oftener than can be explained by this circumstance. It appeared as if there was a greater economy of labor habitually practised in the States, and in conjunction with this there was evidence of the more constant presence of a presiding mind superintending every process of industry. The best machine in the world will fail to give satisfaction if there is not an intelligent human being at hand to watch it, to take care of it, to detect the smallest failure in its working as soon as it is developed, and to suggest and supply the means of correcting any miscarriage of its functions.

A steam engine dropped from heaven in the middle of Africa might be adored, but could not be put to any use. The failure of many of our industrial enterprises in foreign parts can be traced to the difficulty in procuring agents and assistants that can be taught to use the machines committed to their care.

Much of the mechanical work shown at Philadelphia was executed with a fineness that could not have been exceeded if every man who had any share in its production had originally conceived it and had been solely interested in its success. There was evidence of personal care and personal eight months. They have been superseded by an improving anxiety; every stage must have been watched with intelligence and with zeal. In comparing the results with our own, we are painfully suspicious that they revealed the application of more brains than we always have at our command.-Lon-

**** Platinum Plating.

M. Dodé has patented a plan for giving cast objects a coating of platinum. The object as cast, or after being enam-The zinc and silver alloy after being dried is melted in a eled, is first washed over with a brush dipped in turpentine; plumbago crucible, covered on the top, well luted with fire- , a mixture of borate of lead and oxide of copper is next apclay, connected with a cast iron receiver by means of a plied, and the casting dried in a drying stove. The next plumbago pipe, and fired up with coke. The zinc distils step is to immerse the object so prepared in a composition over, and is condensed in the iron receiver. After all the of borate of lead, German litharge, platinum in the state of zinc has been distilled, the pipe is disconnected, the cover chloride, ordinary ether, essence of lavender, and anilic (?) removed, and the lead and silver left in the crucible is ladled acid. Finally, the platinized object is submitted to the ac-

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DECISIONS OF THE COURTS. Supreme Court of the United States.

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	LEWIS, APPELL	ANTS, V8. JOHN	NEWTON	, WASHINGTON	ISETTS,	CHARLES
i i	ECCLESTON, AN	D WILLIAM L.	QUINN.			
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[Appeal from the Circuit Court of the United States for the District of New York.-Decided October Term, 1876.]

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MENDELEJEFF'S TABLE OF ELEMENTS.

VI.

VП.

Lead Desilverizing by the Zinc Process

zinc, invented by Mr. Flach and tested at the smelting works of Messrs. Guillem at Marseilles, was fully described in the Mining Journal, and an interesting account is now given by Mr. James E. Stoddart of the manner in which the

covered in the condenser is removed, and used over again in Some few years since the system of desilverizing lead with the first part of the process. All the oxide of lead and dross formed in the different processes are taken to the reducing furnace, mixed with the coal dross, and reduced back to the metallic state. The dross from this furnace still contains some lead, and is put through the slag hearth—a blast furnace process is carried on by Mr. William Lang, Jr., and Co., at the Clyde Leadworks, Glasgow. He explains that the concensed in what is known as Johnson's patent condenser, thereof, the patentee, or his assig ees, for the whole or part of

Mr. Justice Clifford delivered the opinion of the Court, wh as to th

effect that the device used by defendants was not covered by the patent of plaintiff. The Court affirmed t efollowing points: Inventions may be assigned before they are patented. Public employment is no defence to the employee for having converted the private property of another to the public use without his consent, and with-

private property of another to the public use without his comeent, and with-out just compensation. Frivate property, the Constitution provides, shall not be taken for public use without just compensation, and it is clear that that provision is as ap-plicable to the Government as to individuals, except in cases of extreme necessity in time of war, and of imminent and impending public danger. A patentis private property, and the Government cannot, after it is issued, make use of the improvement any more than a private individual without license of the inventor, or making him compensation.

..... Important Patent Decision in Canada,

In 1873 the Canadian Patent Office granted three patents to George T. in the one for a process of milling, and two for four dressing machines. The following is an extract from the Patent Act of 1872, as amended in 75-1875:

1875: SECTION 28.—Every patent granted under this actshall be subject and ex-presed to be subject to the condition that such patent and all the rights and privileges thereby granted shall cease and determine, and the patent shall be null and void at the end of two years from the date thereof, unless the patentee, or his assignee or assignees, shall, within that period, have commenced, and shall, after such commencement, continuously carry pati-canda the construction or manufacture of the invention or discovery pat-ented in such manuer that any person desiring to use it may obtain if or Canada the construction or manufacture of the invention or discovery pat-ented, in such manner that any person desiring to use it may obtain it, or cause it to be made for him at a reasonable price, at some manufactory or

h s interest in the patent, imports, or causes to be imported, into Canada, the invention for which the patent is granted; and provided always, that in case disputes should arise as to whether a patent has or has not become null and void under the provisions of this section, such disputes shall be settled by the Minister of Agriculture or his Deputy, whose decision shall be final

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Deputy of the Minister of Agriculture.

DEPARTMENT OF AGRICULTURE, PATENT OFFICE, OTTAWA, 15th February, 1877.

NEW BOOKS AND PUBLICATIONS.

NATURAL PHILOSOPHY FOR BEGINNERS. With Numcrous Examples, Part I: The Properties of Solid and Fluid Bodies. By I. Todhunter, M.A., F.R.S., St. John's College, Cambridge, England. Price \$1.50. London and New York: Macmillan & Co.

Mr. Todhunter's renown as a teacher is well known in this country, where his numerous works on mathematics and mechanics are highly valued and extensively used. His latest work is the above-mentioned, and it is an admirable textbook, prepared and edited with the greatest care and accuracy. The writer evidently possesses in an unusual degree the skill to impart knowledge in clear and unmistakable language, and he presents the phenomena and the laws and applications governing them in a manner specially adapted to the capacities of young students. We com-mend this book to the notice of boards of education, in the belief that the time is coming when elementary science and scientific methods of thought will form part of the common school education of this country.

THE CHEMIST'S MANUAL. A Practical Treatise on Chemistry. By Henry A. Mott, Jr., E. M., Ph.D. Price **\$6**. New York city: D. Van Nostrand, 23 Murray street.

This is one of those books for which professional men generally keep a sharp watch, and which, when purchased, they do not lock up in a case, but place within easy reach of the hand on the working desk. Why they do this is because they have learned or may learn that the author, for some seven years past, has pursued that invaluable habit, the taking of notes Beginning while a pupil of some of our most eminent chemists, he listened attentively and jotted down useful hints and suggestions, important ref-erences, etc., which he has now utilized for his own benefit. Continuing the habit in the practice of his profession, the memoranda soon assumed large proportions; those who knew of their existence, knew also their value their publication, if only for their preservation in permanent form, wassuggested, and hence the large and handsomely executed book before us. The work is by no means a mere compilation, but bears the marks of close and assiduous labor. Every scheme of analysis, for instance, has been proved to be thoroughly right; and as every formula for every reaction is given, this part of the book is of especial value to the student. Another

with the circumstances of its production, made every effort to prevent its circulation. The present publisher, as a matter of charity and good taste, should have respected these desires. Hereafter, books of this class sent to us will remain unnoticed.

A TEXT BOOK OF MINERALOGY. By Edward S. Dana. Price \$5. New York city: John Wilcy & Sons, 15 Astor place.

This work originated with Professor J. D. Dana, who undertook its preparation several years ago, but was compelled to relinquish the task because of ill health. The present editor has now carried out the plan, and has produced a very excellent book. It is brought fully up to the latest discoveries and investigations; the modern system of chemical formulæis used throughout; and the general arrangement of the volume could hardly beimproved. The work is especially valuable as a book of reference for the library, as its various subjects are concisely yet fully treated, while they are rendered conveniently accessible through a copious and valuable index. For schools and colleges, probably no better text book relating to this important subject could be found than this.

ROSE CULTURE.-The Dinger and Conard Company, of West Grove, Chester county, Pa., the great rose vine culturists, have just issued their annual catalogue for 1877. The pamphlet is illustrated, giving names and cuts of new varieties, with instructions as to soil and how to grow and propagate roses in the best manner. We have purchased of Messrs. Din-ger & Conard's Company a variety of plants at different times, with invariable satisfaction as to the result. To persons interested in roses, we would ecommend the inclosure of 10 cents to the above firm for a copy (by mail) of their new manual.

DREAMS OF A FREE TRADE PARADISE.-This is a gathering of humorous sketches and dialogue, with 12 illustrations on free trade. A very amusing pamphlet. Price 36 cents. Henry C. Baird & Co., Philadelphia, Pa.

Inventions Patented in England by Americans. From February 20 to March 8, 1877, inclusive. ALLOY.-F. Raymond, Greenville, S. C. BALETIE.-J. H. Elsworth, Galveston, Texas. BATH, ETC.-C. A. Blessing, Philadelphia, Pa. BOOT SOLE.-S. J. Gordon, New York city. BRAKE AND RUDDER.-J. Hutton, New York city. BREECH-LOADING GUN .- F. L. Bailey (of Indianapolis, Ind.), London, Eng CAMPAIGNE BISCUIT .-- C. Morfit (of Baltimore. Md.), London, Eng. CLEANSING WOOL, ETC.-O. LOW, Chelsea, Mass. CRUTCH FERRULE, ETC.-T. C. Allen, New York city. DISPLAY CARD, ETC.-H. H. Snow, New Haven, Com. HARROW, ETC.-G. W. Martin, Port Hudson, La. HORSE COLLAR.-E. Payne, Chicago, Ill. KNIFE-CLEANING MACHINE-L. Guex, Springfield, Ill. KNITTING MACHINERY, ETC.-C. H. Landenberger, Philadelphia, Pa. LIGHTING GAS.-C. K. Trull, New York city. LOCOMOTIVE ENGINE.-H. C. Wells, Brooklyn, N. Y. PRESERVING MEAT, ETC. – J. P. McLean, New York city. SCREW MACHINERY. – J. A. Kernochan, Pittsfield, Mass. SKATE FASTENING.–E. H. Barney, Springfield, Mass. SPINNING MACHINERY.-E. H. Darney, Springheud, Mass. SPINNING MACHINERY.-E. Harris, Providence, R. I. TAG, ETC.-T. P. Marston, New York city. WASH STAND.-H. A. Richardson, New York city.

Recent American and Loreign Patents.

NEW MISCELLANEOUS INVENTIONS.

IMPROVED CARD RACK

Francis Havek, New York city.-In this card rack any desired number of cards may be arranged in alphabetical and regular manner, so as to be instantly found, the rack being of compact shape and admitting the arrangement of twice the number of cards on the same space as the card racks in common use. The card rack has a number of pivoted clamp pieces that are connected to a slide rod, to be thrown to one side or the other for putting in or taking off cards from the clamps. The cards whose names begin with one letter form the face, those with the next letter of the

Charles W. Hovis, Parker City, Pa., assignor to himself and W. J. Hovis, of same place.-This invention is a revolving case containing chambers suitable for holding a charge in each one for the gun to be loaded, working between two plates which close the chambers at the ends, except at one place, where there is a chamber to receive the muzzle of the gun to be loaded, and hole through each plate coinciding with it, so that the load can be pushed out of the loader into the gun when the muzzle of the latter is in said chamber, and under each chamber is a valve to retain the load till ready for discharge.

IMPROVED BALE TIE.

James M. Polland, New Orleans, La.—This invention is an improvement upon the so-called "B" tie, for which letters patent were granted to same party on November 28, 1876. In the present invention, the lug or projection, which in the former invention engages the slotted band, is dispensed with also the slots in the free end of the hand, and a roller or movable cam is employed for engaging the band and effecting the "lock."

IMPROVED FLUID MEAT.

John L. Johnston, Sherbrooke, P. Q., Canada.-This is a compound conwell known gelatined meat essence.

IMPROVED TYPE MOULD.

Thomas Mason, New York city, assignor o David Wolfe Bruce, of same place.-This is a type mould provided with one or more oppositely disposed angular projections or shoulders within its breaks for severing the jct from the type. Its object is to dispense with that process of type-founding known as "breaking off."

IMPROVED NECK YOKE RING

IMPROVED FOLDING SEAT.

Arthur B. Cogswell, Burlington, Vt.-This seat is so constructed that it nay be folded so compactly that it will occupy no more space than the breadth of the side frames or standards. When the seat is extended for use, the rear edge is raised and drawn forward, bringing the pins into the long arm of the slot in the standard. The scat then drops, by its own weight, into position.

IMPROVED INDICATOR.

Charles C. Curtiss and James Curtis, Chicago, Ill.-This is an improved dial, on which a business man, upon leaving his office, may indicate with great facility whether he is in or out, or that he is out and back at a certain time. It consists of a base dial, with the hours and the words "In," "Out," "Back at " marked thereon, on which, within the outer circumference, a second partly recessed plate or disk is guided, and above the same one or two index hands for indicating the time, the recessed plate and hands being returned by a face plate or disk.

IMPROVED VAPOR BURNER.

Frederick A Sawyer, Houston, Tex., assignor to himself, Addison H. Baldwin, and Artemas N. Carter, of same place.—This is an improved construction of a vapor burner, by which the same may be readily lighted or adjusted to a larger or smaller flame. An outer sleeve or $jac_{K}ct$ with disk-shaped flange slides below the outer burner tube for protecting the burner against a draft of cold air from below.

IMPROVED BAGGAGE CHECK GUARD.

David Untermeyer, New York city .- With this device no one, not even the baggage-master, can see the check or know what it is after the duplicate check and the key have been delivered to the passenger, until such passenger presents his check and key. In the outer side of a door is formed a slide to receive a ticket, upon which is marked the place to which, and the place from which, the baggage is sent. With this device it would be useless for a thief to change the direction ticket, and thus chauge the destination of the trunk, as even then he could not get the trunk without the check and key, which the owner of the trunk carries.

NEW WOODWORKING AND HOUSE AND CARRIAGE BUILDING INVENTIONS.

IMPROVED METHOD OF VENTILATING ROOMS.

Gregory C. Quezada, Troy, N. Y.-The object of this invention is toprovide fresh air continually for theaters, churches, rooms, etc., and also at the same time to lower the temperature of the same and supplya certain degree of moisture. The invention consists of an outer pipe column or tubular body of suitable non-porous material and of an inner pipe of porous material, between which a space is formed that is filled with water or other liquid. The air is drawn through or forced through the tube by a fan or otherwise, and supplied to the room at reduced temperature. The apparatus is based on the principle of lowering the temperature by the evaporation of water or other liquid percolating through a porous pipe. The air in its passage through the porous pipe is thus cooled and furnished to the rooms.

IMPROVED SASH BALANCE.

Jules Houriet, Terre Haute, Ind.-This invention consists of the combination, with the upper and lower sashes, of a cord that is connected to the upper sash, clamped to the lower sash, and passed over a pulley at the top of the window casing. For raising the lower sash the upper cord is taken hold of and pulled till the sash arrives at the required height, where it is fastened by a suitable sash lock, it being lowered again by its own weight on the release of the lock.

IMPROVED BOX-NAILING MACHINE.

Amos P. Goodhue, Fond Du Lac, Wis .- This is an improved machine for nailing together the parts of round boxes, enabling the boxes to be nailed quickly and accurately. In using the machine, the bottom of the box is placed upon the center of a plate, and the hoop of the box is placed upon the flanges around the edge of the said bottom. A crank is then turned to bring all the slide blocks inward to rest against the hoop of the box, and press it against the edge of the said bottom. A shaft is then surned until punch holders have reached the limit of their forward movement, and the punches are then adjusted so that their forward ends may strike the hoop of the box. The punches are then drawn back, nails are inserted into the dies, the die holders are turned down into a horizontal position, and the punch-driving mechanism is thrown into gear, which carries the punches forward and forces the nails into the box. As the punches are withdrawn their driving mechanism is thrown out of gear, and the die holders rise into a vertical position, so that another set of nails can be readily placed in their dies.

IMPROVED METHOD OF OPERATING SAWMILL CARRIAGES. Martin Lally, Eau Claire, Wis .- The wheel on the driving shaft, being rotated, causes a chain to draw the carriage in one direction or the other with a positive motion. The tightening pulleys take up the slack in the chain, so that the carriage answers to every motion of the driving wheel.

NEW TEXTILE INVENTION.

IMPROVED SPOOLER.

Samuel F. Cobb, Alberton, Md.-This invention relates particularly to the form or construction of a slotted cam cylinder and the combination of the same with traversing bars carrying the thread guides and working horizontally in slots formed in the sides of the arches, or frames, in which sisting of lean flesh and albumen, in the form of a dry powder, and the the spool spindles are journaled. The machine can be so changed as to increase or decrease the traverse simply by removing the gear, thereby enabling the operator to make as even and regular layers when spooling number four yarn as when spooling number fifteen, presenting all the while the spool is being filled a smooth even surface to the thread, consequently the spool must be finished as commenced. In other spooling machines, the traverse is generally worked without this provision, and changing them from fine to coarse numbers produces an uneven ridgy surface, which grows worse as the spool increases in size,

very important portion of the volume, to druggists and physicians, is an elaborate table wherein all drugs in use are named, and their usual impurities denoted, and how the same may be detected. Dr. Mott deals in extenso with qualitative, quantitative, and blowpipe analyses, assaying, mineralogy, stoichiometry, and specific gravity determinations, and adds a miscellaneous department, replete with the species of information which, though constantly needed, is scarcely ever found collated. The authors style of writing throughout is plain and direct, the explanations are lucid, and altogether the work is one we can cordially commend.

DYNAMICS OR THEORETICAL MECHANICS. By J. T. Bottomley, M.A., etc. New York city: G. P. Putnam & Co., 182 Fifth avenue.

This is another volume of Putnam's "Elementary Science Series." It is a good simple treatise, as a rule clearly written; but it reveals obscurity in the writer's mind as to the proper definition of the term "force." This is the grand stumbling block for writers on mechanical subjects, and it is high time that a definite meaning should be attached to so fundamental a conception.

AN ANALYSIS OF RELIGIOUS BELIEF. By Viscount Amber-

ley. New York city: D. M. Bennett.

that the columns of this journal are not open to the discussion review or criticism of matters pertaining to religious faith; and that it is entirely useless to send us letters or books on such subjects. The volume above named is the work of a young English nobleman, now deceased. It created great comment in England at the time of its publication, and caused much pain to the friends and relatives of its author, who, being best conversant, and hair that may be adhering to the tooth plates.

Charles Shuman, Red Oak, Iowa.-This ring is so constructed as to allow the neck yoke to be turned nearly parallel with the tongue.

IMPROVED LASTING JACK.

Charles H. Collins, Lynn, Mass., assignor to himself and Francis Deshon of same place.-The advantages claimed for this invention are that a whole boot or shoe can be lasted complete without the aid of knees or other devices for pulling the upper over. The toe of the boot or shoe may be thrown over, bringing it into a convenient position to last the toe, after which the jack can be readily readjusted to a vertical position. It can be conveniently used at a high or low bench, and the operator may stand or sit at pleasure.

IMPROVED TRAVELER FOR JIB-SHEETS.

Joseph D. Drinker, Montrose, Pa.—This is an improved bar for holding the jib-sheet in a fore and aft vessel, when beating to windward, so as to dispense with a man to attend to said jib. It shifts over the sheet auto matically on going about.

IMPROVED CURRYCOMB.

James N. Rundle, San Francisco, Cal., assignor to himself and David L We would take this opportunity to inform publishers and correspondents Fonseca, of same place.—This currycomb is so constructed that it wil clean itself of dust and hair while being used, rendering it unnecessary to knock it against the timbers of the stall or stable. The frame and the tooth plates play upon a hinge. The movement is limited by a keeper, so that the jar caused by checking the said movement may knock off any dust



NEW AGRICULTURAL INVENTIONS.

IMPROVED SULKY ATTACHMENT FOR PLOWS.

Samuel P. Langsford and Wiley N. Stroud, Waxahachie, Tex.-By this invention a farmer is enabled to apply any kind of plow to the sulky frame, and thereby do all his work with the same without having to walk in plowing. The invention consists of a sulky frame, to which the plow beam is rigidly applied, the connecting pieces and tongue being capable of adjustment to the position of the plow beam on a vertically sliding crosspiece, which is raised or lowered, so as to elevate or depress the plow, by lever onnection with the seat of the sulky.

IMPROVED RECIPROCATING CHURN.

Bernhard Janson, Effingham, Ill.-This invention consists in a churn body having a handle and cover attached thereto, and provided with a socket on its lower side, which is adapted to receive a stud or pin on a stationary base piece or clatform. The churp barrel turns on a fixed axis, and receives a rocking or tilting movement to the right and left, by making the ecess in the projection of the churn larger than the axis pin.

IMPROVED HARVESTER.

Andrew Campbell, Nebraska City, Neb.-This invention consists in two pecial combinations-one for the fingers and bars, the latter with sharp dged front tooth, and another combination of the reciprocating heads, having depending teeth, cutters, and cutter guards, with endloss apron carrying the grain directly back therefrom.