

The Civil Engineers' Convention at Philadelphia.

The eighth annual convention of the American Society of Civil Engineers is now in session in the Judges' Hall at the Centennial. The meeting opened on the 13th of June, Mr. G. S. Greene, C. E., of New York, presiding. Among the papers thus far read is one by Mr. T. G. Ellis, of Hartford, on the Centennial History of Engineering, in which he reviewed progress in this science over the past century. All the facts presented by Mr. Ellis have been fully noted by us in the series of editorials in American progress which recently appeared in these columns. The first regular business transacted by the members was the discussion of a previously published essay, by Mr. C. Bender, on the theory of continuous girders in relation to economy in bridge building. Mr. Pettit, architect of the Main Exhibition Building, read a paper on the character of the engineering work, therein giving the reasons for the adoption of the plan selected. The peculiarity of construction is that it is like the framework of a table. The long iron supports carry the dead weight, and the trusses resist the side pressure. A good test of its stability was made in February last, when a wind having a pressure of 18 lbs. per square foot caused no perceptible vibration. The amount of iron used was 8,340,000 lbs. The iron, flat, angle, and round, measures 141 miles in length and if made into a cubic block, it would measure 25 feet 10 1/4 inches on each edge. There is 1 square foot of glass for each 4 square feet of surface covered. Mr. Pettit also described the general plan of installation of exhibits; and Mr. Schwartzmann, architect of Memorial Hall, explained his construction of that edifice. Complete abstracts of all papers read will appear in the SCIENTIFIC AMERICAN SUPPLEMENT.

Correspondence.

The Locust Pest.

To the Editor of the Scientific American:

The facts mentioned by your correspondent J. F. Dunwoody, of Louisiana, Mo., are interesting, and, for one, I am always glad to get such exceptional facts; but they do not invalidate the other facts recorded by me in the article on locust prospects from which you condensed in a recent number. That locust eggs are destroyed by excessive moisture, and especially by alternately soaking and drying, I have abundantly proved by experiment; and I do not doubt the correctness of the observations of the Minnesota Commission. My conclusions as to locust injuries in 1876 are also most thoroughly substantiated by the experience of the past two months, which, considering the contrary opinions very generally entertained and promulgated last winter, is very strong proof of the correctness of the statements upon which my opinions were based. It is not improbable that eggs in a tenacious slough bottom, continuously covered with water for months, would suffer less than those alternately soaked and dried in a porous soil, on the same principle that vegetation under like conditions would rot sooner in the latter case; and if Mr. Dunwoody were to state the circumstances attending the fact he mentions with more explicitness, so that we could know the nature of the slough bottom, and feel confident that the locusts observed subsequently to its drying up actually hatched there from eggs laid before it was overflowed, we should without doubt find that his observation admits of an explanation in harmony with the opinions which he thinks it invalidates.

As to freezing, the eggs, as I have shown in my own writings, will withstand with impunity almost any amount of it, and the young locusts may also be frozen in solid ice and yet live; but the fact nevertheless remains, and is supported by such extensive experience as not to be gainsaid, that, when the young of the Rocky Mountain species prematurely hatch in fall or during mild winter weather, they are subsequently destroyed by continued severe freezing, or by continued freezing and thawing.

St. Louis, Mo.

C. V. RILEY.

Remarkable Example of Spontaneous Combustion.

To the Editor of the Scientific American:

A singular instance of spontaneous ignition took place in my house some time ago. On entering the house about noon, I detected the smell of something burning. An immediate search was made, and upon entering the parlor I noticed smoke rising from a center table that was placed near a south window. I stepped up to the table and noticed some pieces of cotton goods on fire, which I smothered out with my hand. Alongside of the goods that were on fire lay a stereoscopic instrument that was exposed to the direct rays of the hot noonday sun. It so happened that such was the position of the two lenses that they caused a burning focus on the goods and set it on fire. Had we been absent till an hour later, the fire would have extended itself, to the destruction of the house and all that was in it.

Round Mount, Texas.

G. P. HACHENBERG, M. D.

[Accidental fires produced by lenses have frequently come to our notice. The glass globes filled with water and used to contain gold fish will converge the sun's rays to a focus of sufficient intensity to ignite light materials, and have thus started incipient conflagrations. The heavy glass bullseyes sometimes used for dead lights in ships have also produced similar effects; and we once called attention to a remarkable case where a bulb of glass, formed in a large sheet used as a window pane in a store, and due to a defect in the manufacture, proved the means of setting fire to objects displayed inside. Druggists' show globes of colored water also form powerful lenses, and we once knew of an enterprising apothecary who employed them as a cheap source of heat for his distilling apparatus. Of course there have

been many attempts to utilize the high temperature of the sun's converged rays. Huge mirrors have been built to melt refractory substances. Ericsson has devised a solar engine, and probably the latest invention of the kind is M. Mouchot's solar boiler, where the steam generator is placed in the focus of a concave reflector.—Eds.]

THE Scientific Farmer says that the best way to prevent overheating of compost is to pack the surface down solidly, by simply treading upon the heap with the feet (after pulverization), or, still better, to spread a little earth over the pile, taking care to pack it somewhat. Either method tends to exclude air, and thus prevents too rapid oxidation.

NEW BOOKS AND PUBLICATIONS.

ELEMENTS OF PHYSICAL MANIPULATION. By Edward C. Pickering, Thayer Professor of Physics in the Massachusetts Institute of Technology. Part II. Price \$4. New York city: Hurd and Houghton, 13 Astor Place.

Professor E. C. Pickering's first volume was received with general favor. He has now largely extended the scope of the work, and has introduced subjects not usually considered to belong to the domain of pure physics. The new volume contains an admirable chapter on mechanical engineering, including details of boilers, steam pipes, and indicator diagrams, as well as articles on speed and friction of shafting, belts, and pulleys. The friction brake and transmission dynamometer are fully explained; and some valuable methods of testing speeds of piston rods, shafts, and fly wheels, which are, we believe, entirely new, are described and illustrated. The apparatus employed in the growing science of meteorology occupies one of the most interesting chapters in the book; and the section headed "Practical Astronomy" contains a clear description of the instruments in common use for nautical and stellar observation. Tables of squares, cubes, powers, logarithms, tangents, and sines, and of the properties of metals, liquids, gases, and vapors, are added in appendices, with full explanations. The description of a good physical laboratory and a list of test experiments for students' use complete the work. The laboratory described is that under the charge of the writer, in which about 100 students are instructed every year. We cordially commend the work to all teachers of science classes, as one which they should study themselves and place in the hands of their pupils.

HANDBOOK OF ELECTRICAL DIAGRAMS AND CONNECTIONS. By Charles H. Davis and Frank B. Ræ. Price \$1.50. New York city: The Graphic Company, Park place.

The authors of this work are employees of the Western Union Telegraph Company in this city; and by their joint labor, they have produced a book of the highest value to the telegraph profession. It contains engravings of all the instruments (single, duplex, etc.), relays, batteries, etc., in ordinary use, with well written and detailed descriptions. The historical portions of the book are especially commendable for their accuracy, and for their fairness to the many claimants to the credit of originating the telegraph and its details, who are frequently so numerous and so contradictory as to bewilder the reader. Thirty plates and a map of the world showing all the telegraph cables in existence are added, all being executed by photolithography, in the best style of the art. The work is one of the most complete and useful handbooks we have seen for some time.

THE INFLUENCE OF THE BLUE RAY OF THE SUNLIGHT AND OF THE BLUE COLOR OF THE SKY, IN DEVELOPING ANIMAL AND VEGETABLE LIFE, ETC., as Illustrated by the Experiments of General A. J. Pleasonton and others. Philadelphia, Pa.: Claxton, Remsen, and Haffelfinger.

A good description of the purport and matter of this remarkable work appears in an article on p. 388 of our volume XXXIV. We have little to add to the description there published, except that the book itself is more eccentric than we could have believed, unless guided by a perusal of its contents. The incidents of the cure of rheumatism in a mule by putting panes of blue and colorless glass in the transom window of its stable, the cure of a woman suffering from a complication of undescribed disorders by a similar application, the cure of spinal disease by use of a bath of blue light, and many similar cases cited by the author, remove this book beyond the sphere of legitimate criticism, and place it among the many melancholy burlesques of science and inductive investigation, by the publication of which certain authors are now trying to obtain notoriety.

PRACTICAL TREATISE ON THE CONSTRUCTION OF IRON HIGHWAY BRIDGES, with a Short Essay on the Application of the Principle of the Lever to the Analysis of Strains. By Alfred M. Boller, A. M., Civil Engineer. Price \$2.50. New York city: John Wiley & Sons, 15 Astor Place.

The author states in his preface that he intends this work for the use of town committees; and he has succeeded in producing a work that will be useful to any such bodies having to provide for the construction of bridges. The points to be regarded in designing an efficient structure are enumerated and fully described; and the author's cautious advice regarding specifications and contracts will, if followed, relieve local authorities from much responsibility as to the security of the work. The book is likely to disseminate some practical knowledge of great value and importance.

THE CENTENNIAL NEWSPAPER EXHIBITION, in Fairmount Park, Philadelphia. New York city: George P. Rowell & Co., Park Row.

The publishers of this volume own the well known extensive advertising agency in this city, and the admirable display of American newspaper literature at the Centennial is due to their zeal and enterprise. A description of the very large and varied exhibit of our newspapers and the statistics of American Journalism will be found in this handbook, which should be read by every visitor to the Centennial Exhibition, who will find in the Newspaper Building one of the most attractive displays to be found in the whole show.

CHEMISTRY, THEORETICAL, PRACTICAL, AND ANALYTICAL, as Applied to Arts and Manufactures. Parts V. to X. Philadelphia, Pa.: J. B. Lippincott & Co., 715 Market Street.

The publication of this work was announced when the first four numbers reached us; and the subsequent ones need no comment, being printed in similarly handsome style, with the same characteristics. We must, however, again protest against the concealment of the names of the compilers. Twenty dollars is too much to pay for a book which does not establish its authenticity and accuracy by giving information as to its authorship.

PRINCIPLES OF APPROXIMATE COMPUTATIONS. By Joseph J. Skinner, C. E., Instructor in Mathematics in the Sheffield Scientific School of Yale College. New York city: Henry Holt & Co.

This treatise is likely to prove of especial value in solving those numerous problems which involve repeating decimals, as well as those in which occur measurements with instruments capable of giving only a limited degree of precision. These difficulties are dealt with by the author in a very practical manner; and his method produces results which are little at variance with those obtained by continued calculation.

THE AMERICAN SYSTEM, GERMAN. A Record of Professor C. C. Schaeffer's High School Test Course. Philadelphia, Pa.: Charles, Brother, & Co.

This book is the record of a vast amount of information, imparted to the pupils of the Philadelphia Central High School, in six lessons of 45 minutes each. Although published without any evident order or arrangement, it contains several excellent features, among which may be mentioned the construction of German sentences, the explanations of gender and *Umlaut*, and a quaint lecture on "The Philosophy of the English Language."

PRICE LISTS OF GOODS MANUFACTURED IN THE BIRMINGHAM DISTRICT, ENGLAND. Part I. London, England: Published by the Proprietors of "Iron," 12 Fetter Lane.

HIGH MASONRY DAMS. By John B. McMaster, C. E., Author of "Bridge and Tunnel Contrs." Price 50 cents. New York city: D. Van Nostrand, 23 Broadway and 27 Warren Street.

A practical and valuable little treatise, being No. 22 of Mr. Van Nostrand's Science Series.

SEVENTH ANNUAL REPORT OF THE STATE BOARD OF HEALTH OF MASSACHUSETTS, just published, is replete with useful information. Most of the legislative publications of the Old Bay State are so; but this cannot be said of many statistical reports issued by some other States, or of a great number which are authorized and published by approval of Congress. We are indebted to the State Board of Health, each year, for an early copy of their report, from which we are enabled to extract much useful information for our readers. The document before us leaves no branch of the subject of sanitary science untouched; and the statistics, especially those affecting population and mortality, are sufficient to convince any one of the national importance of the compulsory observance of health regulations. The report, moreover, furnishes to other State and city boards an excellent model for the preparation of such volumes, and a guide for the investigation of the subjects, which it would be well for them to follow.

DECISIONS OF THE COURT

Supreme Court of the United States.

PATENT ERASER PENCILS.—JOSEPH RECKENDORFER, APPELANT, vs. EBBERHARD FABER.

Appeal from the Circuit Court of the United States for the Southern District of New York.

MR. JUSTICE HUNTER delivered the opinion of the Court. This is an appeal from a decree of the United States Circuit Court for the Southern District of New York, dismissing the bill of complaint which was filed to restrain the infringement by the respondent of certain letters patent, and for an accounting and damages.

These patents relate to the manufacture of combined pencils and erasers. The first was granted to Hymen L. Lipman, March 30, 1853, and was extended for a further term of seven years from the 30th of March, 1872.

The material parts of the specification are as follows: "I make a lead pencil in the usual manner, reserving about one fourth of the length, in which I make a groove of suitable size, A, and insert in this groove a piece of prepared india rubber (or other erasable substance) secured to said pencil by being glued at one edge; the pencil is then finished in the usual manner, so that on cutting one end thereof you have the lead on one cutting edge and the rubber on the other, in a piece of india rubber, C, ready for use, and particularly valuable for removing or erasing lines, figures, etc., and not subject to be soiled, or mislaid on the table or desk. "In making mathematical, architectural, and many other kinds of drawings, in which the lines are very near each other, the eraser is particularly useful, as it may be sharpened to a point to erase any mark between the lines; and should the point of the rubber become soiled or imoperative from any cause, such cause is easily removed by a renewed sharpening, as in the ordinary lead pencil."

The claim is as follows: "I do not claim the use of a lead pencil with a piece of india rubber, or other erasing material, attached at one end for the purpose of erasing marks, but what I do claim as my invention is a pencil in which the rubber is secured to the pencil by means of a lead, in the holder of a drawing pencil, the whole being constructed and arranged substantially in the manner and for the purposes set forth."

The drawings forming part of the specification exhibit a continuous sheath of uniform size, with interior grooves of different sizes; the eraser groove being larger than the lead groove. The second patent is for an improvement upon the invention of Lipman, and was granted to Joseph Reckendorfer, the complainant, the 11th of November, 1862, and reissued on the 1st of March, 1872.

The material parts of the specification are as follows: "My invention is intended to provide a means whereby articles of greater size or diameter than the lead may be accurately held in the head of a pencil of otherwise ordinary or suitable construction without making the body of the pencil cumbersome or inconvenient. To this end my invention consists: "First.—Of a pencil composed of a wooden sheath and lead core, having one end of the sheath enlarged and recessed to constitute a receptacle for an eraser or other similar article, as hereinafter stated. "Second.—Of a pencil, the wooden case of which gradually tapers from its enlarged and recessed head toward its opposite end for the whole or a portion of its length, as hereinafter set forth. "The receptacle for the eraser or other article is formed in the head, without too much weakening the wood, owing to the form of the sheath, while for the same reason the end of the pencil which contains the ordinary lead is not cumbersome or clumsy, but can be readily held between the fingers, just as an ordinary pencil is."

Having thus described his invention, Reckendorfer claims— "1. A pencil composed of a wooden sheath and lead core, having one end of the sheath enlarged and recessed to constitute a receptacle for an eraser, or other similar article, as shown and set forth. "2. A pencil, the wooden case of which gradually tapers from its enlarged and recessed head toward its opposite end for the whole or a portion of its length, substantially as shown and described."

HOW THE PATENTABILITY OF AN INVENTION IS DETERMINED.

The points we propose here to discuss are two: First, Is the invention patented by the plaintiff and his assignor, and for the infringement of which patents this action is brought, a patentable invention within the laws of the United States? Second, Is it within the power of the courts to examine and determine this question, or is the decision of the Commissioner of Patents, when, by issuing a patent, he decides that the invention is patentable, final and conclusive on the point?

The plaintiff contends that the decision of the Commissioner is conclusive upon the point of invention, and that the question, as distinct from that of want of novelty, is one not open to the judgment of the court. In the natural order of things this question is the first one to be examined. For if it shall appear that the contention of the plaintiff is correct in this respect, the question in regard to the patentability of the instrument now before us will not arise. The point will have been decided for us, and by a controlling authority.

The act to revise, consolidate, and amend the statutes relating to patents and copyrights, passed July 4, 1836, (5 U. S. Stats., 118.) is the act regulating this case. By the 6th section thereof it is enacted "that any person having invented or discovered any new and useful art, machine, manufacture, or composition of matter not known or used by others before his invention or discovery thereof, and not at the time of his application for a patent in public use, or on sale with his consent or allowance as the inventor or discoverer, and shall desire to obtain an exclusive property therein, may make application in writing to the commissioner expressing such desire, and the commissioner, after the proceedings had, may grant the patent if he believes on oath that he believes himself to be the first inventor or discoverer thereof, and that he does not know or believe that the same has ever before been used."

Looking at this section alone it may be safely said no one is entitled to a patent unless (1) he has discovered or invented an art, machine, or manufacture, (2) which is new and useful, (3) which is not known or used by others as herein mentioned. It is not sufficient that it is alleged, or supposed, or even adjudged by some officer to possess these requisites. It must in fact possess them, and that it does possess them the claimant must be prepared to establish in the mode in which all other claims are established, to wit, before the judicial tribunals of the country.

The 7th section of the act (p. 120) provides that on the filing of any such application, etc., and the payment of the duty required by law, the commissioner shall make, or cause to be made, an examination of the alleged new invention or discovery, and if on such examination it shall not appear to the commissioner that the same has been invented or discovered by any other person in this country prior to the alleged discovery, or patented, or described in any foreign publication, or been in public use, or on sale with the consent of the applicant, and if he shall be of the opinion that the same is sufficiently useful and important, the commissioner shall issue a patent therefor.

Before the commissioner is authorized to issue a patent it must appear to him that the claimant is justly entitled to a patent, that is, that his art, machine, or manufacture possesses all the qualities herein mentioned. The commissioner must also be satisfied that if it possesses these qualities it is sufficiently useful and sufficiently important to justify him in investing it with the *prima facie* respect arising from the governmental approval. These restrictions are wise and prudent, and are intended to secure at least a probable advantage to those who deal with the favorites of the government, for they may justly be so termed who receive the exclusive right of making or using, or vending particular arts or improvements.

THE JUDGMENT OF THE COMMISSIONER OF PATENTS IS NOT CONCLUSIVE.

It is nowhere declared in the statute that the decision of the commissioner as to the extent of the utility or importance of the improvement shall be conclusive upon that point, but in the section just quoted it is placed in the same category with the want of novelty and the other requisites of the statute, and it is expressly conceded by the appellant that the judgment of the commissioner on the question of novelty is not conclusive, but that that point is open to examination. On that subject the practice of the courts is uniform in holding it to be subject to enquiry.

The plaintiff's counsel, in his brief, puts his argument in this form: "The commissioner, then, passes on these questions: 1. Did the applicant himself make the invention? This question is settled by his oath. This is true to the extent and for the purpose of issuing a patent, and to this extent only. When the patentee seeks to enforce his patent, he is liable to be defeated by proof that he did not make the invention. The judgment of the commissioner does not protect him against the effect of such evidence."

"2. The counsel says: was the invention new? This question is solved by the examination required by the act. To the same extent only. The defence of want of novelty is set up every day in the courts, and is determined by the court or the jury as a question of fact upon the evidence adduced, and not upon the certificate of the commissioner. "3. The counsel says again: Is the invention sufficiently useful and important? This the commissioner settles for himself by the use of his own judgment. It is a question of official judgment. These questions are all questions of official judgment, and are all settled by the judgment of the commissioner. His judgment goes to the same extent upon each question. He determines and decides for the purpose of issuing or refusing a patent. When the patent is granted to be enforced, the questions, and each of them, are open to judicial examination. We see many reasons why all the questions of invention, novelty, and prior use should be open to examination in each case, and such we believe to be the course of the authorities and practice of the courts."

A reference to some of the most recent cases, and to those decided by this court will be sufficient. A review of all the cases in this court and the various circuit courts where this question has been alluded to will not be profitable.

THE MERE SUBSTITUTION OF ONE WELL KNOWN MATERIAL FOR ANOTHER IS NOT PATENTABLE.

In *Hochkies vs. Greenwood* (11 How., 238), a patent had been granted for a "new and useful improvement in making door and other knobs, of all kinds of clay used in pottery and of porcelain," by having the cavity in which the screw or shank is inserted, by which they are fastened, largest at the bottom of its depth in form of a dovetail, and a screw formed therein by pouring in metal in a fused state. The precise question argued in this case and decided as of the patentability of an invention, and it was held not to be patentable. The thing claimed as new was the substitution of a knob made of clay or porcelain for one made of wood. This, it was said, might be cheaper or better, but it was not the subject of a patent. The counsel for the defendants, in their points, there say: "The court now is called upon to decide whether this patent can be sustained for applying a well known material to a use to which it had not before been applied, without any new mode of using the material or any new mode of manufacturing the article sought to be covered by the patent." Mr. Justice Nelson delivered the opinion of the court to the effect already stated. Mr. Justice Woodbury dissented, not upon the question of the power of the court to pass upon the validity of the patent, but rather in regard to the manner in which the facts were submitted to the jury.

In *Stimpson vs. Hardin* (10 Wall., 80), it was decided that the engraving or stamping of the figure upon the surface of a roller for pebbling leather by pressure, where the use previously had been of a smooth roller, required no invention, that it was a change involving mechanical skill merely, and not patentable. Mr. Justice Clifford dissented from the majority of the court, but expressly says that the question of patentability is for the decision of the jury and not of the court, upon a bill of exceptions. The majority of the court held that the question could be considered upon a bill of exceptions, and no one claimed that the decision of the commissioner concluded the question.

In *Halles vs. Van Wormer* (20 Wall., 333), the question of the patentability of certain improvements in stoves was largely discussed in this court upon appeal from the Circuit Court for the Northern District of New York. It was held that, if a new combination produces new and useful results, it is patentable, though all the constituents of the combination were known and in use previous to the combination. But the results must be the product of the combination, not a mere aggregate of several results, each the complete product of one of the combined elements. It was held that the facts there presented did not constitute a combination with this principle, and the judgment, that the plaintiff's bill be dismissed, was affirmed.

In *Rubber Tip Pencil Co. vs. Howard* (20 Wall., 498), the same principle was affirmed. In delivering the opinion, the Chief Justice says: "The question which naturally presents itself for consideration at the outset of this inquiry is whether the new article of manufacture, claimed as an invention, was patentable as such, or, if not, there is an end of the case. Each need not go farther. He makes a careful examination of the claim, and concludes that there is nothing patentable in the character of the invention." In *Smith vs. Nichols* (21 Wallace, 115), an elaborate opinion to this same effect was delivered by Mr. Justice Swayne, and concurred in unanimously by the court. The only question discussed is the patentability of the invention.

Hicks vs. Kelsey, 18 Wall., 670, is a similar case. To this rule the case of *Lyman vs. Osborne* (11 Wall., 516), cited by the defendant, is no exception. The remarks there made are chiefly upon the subject of reissues, and are in accordance with the principles above set forth. Even as to reissues, their conclusiveness is limited to questions of fact, and is accompanied by the statement that the invention is not patentable if it is merely a restatement of the face of the patent that the commissioner has exceeded his authority, or there is such a repugnance between the old and the new patent that it must be held as a matter of legal construction that the new patent is not for the same invention as that embraced and secured in the original patent.—(p. 513-4.)

We do not attach much significance to the fact that the 15th section of the act of 1836 allows the defendant to plead the general issue, and to give in evidence upon thirty days' notice special matters tending to prove the various matters therein referred to. The statute in that respect was intended to create an easy system of pleading, and to relieve from any doubt the admissibility in that form of the defenses specified. The argument that, because persons are allowed to plead the general issue that the defendant's declaration does not contain the whole truth, or that it intentionally and deceitfully contains too much, or that the patentee was not the first discoverer, or that it had been in prior use, it follows that proof that there is no invention or discovery at all, or that the invention has no importance, cannot be made, is quite unsound. Proof that there is no invention or discovery strikes at the root of the whole claim. The patent is based on an affirmative fact, of which this is the direct negation. It needed no statute to aid or justify this defence. It is provable when it exists under any general denial, like the fact of not guilty or non-assumpsit in cases where guilt or a promise is first to be established.

THE COMBINATION OF A PIECE OF RUBBER WITH A LEAD PENCIL NOT A PATENTABLE INVENTION.

2. We come, then, to the question: Does the article patented by Lipman and improved by Reckendorfer involve an invention, or is it a product of mechanical skill or a construction of convenience only? The article presented is for the performance of mechanical operations, to produce mechanical results, and is a mechanical instrument as much as a brush, a pen, a stamp, a knife, a file, or a screw. Whether it is styled a manufacture, a machine, or a method, it is an instrument intended to produce a useful mechanical result, and the question presents itself: Does it embody any new device, or any combination of devices producing a new result?

In the first place, what is not claimed by the specification of Lipman is to be observed. "I do not claim (he says) the use of a lead pencil with a piece of rubber attached to one end. Of course he does not claim a lead pencil as his invention, but he does claim the use of such a pencil. Each of these articles had been in long and general use. But he claims as his invention 'the combination of the lead and india rubber in the holder of a drawing pencil,' in the manner set forth. The claim is simply of the combination of the lead and india rubber in the holder of a drawing pencil; or, in other words, the use of an ordinary lead pencil, in one end of which, and for about one inch in length, is inserted a strip of india rubber, glued to one side of the pencil. The pencil is to be made in the usual manner, of suitable size, he takes an ordinary lead pencil, and in this he makes a groove of suitable size," giving no idea of what he deems a suitable size, and in this groove he inserts a piece of prepared india rubber, which is glued to one side of the pencil. The pencil is then finished in the usual manner, so that in cutting one end of the lead B, and on cutting the other end you expose a small piece of india rubber C, ready for use. It is evident that this manner of making or applying the instrument gives no aid to the patent. It must rest where the patentee claims to place it, that is, on the combination.

This combination consists only of the application of a piece of rubber to one end of the same piece of wood which makes a lead pencil. It is as if a patent should be granted for an article of manufacture, as the patentee prefers to term it, consisting of a stick twelve inches long, on one end of which is an ordinary hammer, and on the other end is a screwdriver or a tack drawer, or, what you will see in use in every retail shop, a lead pencil, on one end of which is a steel pen. It is the case of a garden rake, on the handle end of which should be placed a hoe, or on the other side of the same end of which should be placed a scythe. All these cases might be the advantage of carrying about one instrument instead of two, or of avoiding the liability to loss or misplacing of separate tools. The instruments placed upon the same rod might be more convenient for use than when used separately. Each, however, continues to perform its own duty and nothing else. No effect is produced. No result follows from the joint use of the two.

A handle in common, a joint handle, does not create a new or combined operation. The handle for the pencil does not create or aid the handle for the eraser. The handle for the eraser does not create or aid the handle for the pencil. Each has and each requires a handle the same as it had and required, without reference to what is at the other end of the instrument, and the operation of the handle of one is precisely the same whether the eraser or the pencil is or is not at the other end of it. In this and the cases supposed, you have but a rake, a hoe, a hammer, a pencil, or an eraser, when you are done. The law requires more than a change of form, or juxtaposition of parts, or of the external arrangement of things, or of the order in which they are used, to give patentability.—*Curtis vs. Patents*, 55; *Halles vs. Van Wormer*, 20 Wall., 333. A change of form is not patentable, and its cheapness makes it so.—*Curtis*, § 56, 73. An instrument or manufacture which is the result of mechanical skill merely is not patentable. Mechanical skill is one thing. Invention is a different thing. Perfection of workmanship, however much it may increase the convenience, extend the use, or diminish expense, is not patentable. The distinction between mechanical skill and invention, and the advantages and disadvantages of each, is recognized in all the cases.—*Rubber Tip P. Co. vs. Howard*, and other cases, *sup.*; *Curtis*, § 72, b.

WHAT CONSTITUTES A PATENTABLE COMBINATION.

The combination to be patentable must produce a different force or effect, or result in the combined forces or processes, from that given by their separate parts. There must be a new result produced by their union. If not so, it is only an aggregation of separate elements. An instance and illustration is found in the discovery that by the use of sulphur mixed with india rubber the rubber could be vulcanized, and that without this agent the rubber could not be vulcanized. The combination of the two produced a result or an article entirely different from that before in use. Another illustration may be found in the frame in a sawmill which advances the log regularly to meet the saw, and the saw which saws the log: the two cooperate and are simultaneous in their joint action of sawing through the whole log; or in the sewing machine, where one part advances the cloth and another part forms the stitches, the action being simultaneous in carrying on a continuous sewing. A stem-winding watch key is another instance. The office of the stem is to hold the watch or hang the chain to the watch. The office of the key is to wind it. When the stem is made the key, the joint duty of holding the chain and winding the watch is performed by the same instrument. A double effect is produced or a double duty performed by the combined result. In these and numerous like cases the parts cooperate in producing the final effect, sometimes simultaneously, sometimes successively. The result comes from the combined effect of the several parts, not simply from the separate action of each, and is, therefore, patentable.

In the case we are considering the parts claimed to make a combination are distinct and disconnected. There is no new result not only, but there is no joint operation. When the lead is used, it performs the same operation and in the same manner as it would do if there were no rubber at the other end of the pencil. When the rubber is used it is in the same manner and performs the same duty as if the lead were not in the same pencil. A pencil is held down and a rubber is taken up, the one to write, the other to erase. The pencil is turned over to erase with, or an eraser is turned over to write with. The principle is the same in both instances. It may be more convenient to have the two instruments on one rod than on two. There may be a security against the absence of the tools of an artist or mechanic from the fact that, the greater the number, the greater the danger of loss. It may be more convenient to have one stick taken up, the one to write, than to have one stick and take up another. This, however, is not invention within the patent law, as the authorities cited fully show. There is no relation between the instruments in the performance of their several functions, and no reciprocal action, no parts used in common.

We are of the opinion, that for the reasons given, neither the patent of Lip-

man nor the improvement of Reckendorfer can be sustained, and that the judgment of the circuit court dismissing the bill must be affirmed.

Strong, J.—I dissent from so much of the opinion of the majority of the court as holds that the instrument or manufacture described in the patents exhibits no sufficient invention to warrant the grant of a patent for it.

Recent American and Foreign Patents.

NEW MECHANICAL AND ENGINEERING INVENTIONS.

IMPROVED CAR COUPLING.

Wilfort H. Farris, Troy Station, Tenn.—When the cars are run together, the projecting end of a bar strikes against the end of the opposite drawhead, which causes bars to throw the link forward, so as to drop over the pin of the advancing drawhead. As the link drops into place, it strikes a pin and throws a pivoted block down, and the coupling is completed.

IMPROVED WATCH KEY.

John S. Birch, New York city.—The essential feature of this watch key is a contrivance by which adjustable cone-shaped jaws, for fitting parts of different sizes, are made to open by being thrust out of the end of a tubular case by a spirally grooved revolving tube. They are closed on the post to hold it for turning by a gentle endwise pressure on the case. Another feature of the invention is a friction contrivance to prevent the torsional action of the case on the cone-shaped jaws from working them loose on the post.

IMPROVED LEATHER-ROLLING MACHINE.

John Bright, Stoneham, Pa.—This is an improved machine for rolling sole leather, which includes several novel features in mechanical construction, mainly intended to render it simple, powerful, easily operated, and to enable it to pass over thick places in the leather without any jar to the foot lever.

IMPROVED CIGARETTE MACHINE.

Joseph Marengo and Alexandro Marengo, Montreal, Canada.—This invention consists in combining, with an adjustable roll, endless bolt, and operative mechanism, a pair of rolls arranged on arms, one rigid and the other hinged, the former provided with a stop, and the latter with a regulating screw. By this means, the approximation of the rolls is definitely gaged, according to the size of cigar that is being made.

IMPROVED EXPANDING WELL CURB.

Alexander A. Peck, Hammond, Wis.—This consists of an expanding curb, to be used for cement-lining wells, constructed with a sectional shell of vertical planks and sheet metal plates for lapsing the joints, and with adjustable arms and expanding rims. The latter are coupled to a center shaft by which the shell is expanded and contracted, and also shifted along as the work progresses.

IMPROVED ELEVATOR.

Jacob Meyer, Hollowayville, Ill.—To each arm of a braced cross-piece, at the top of a post, are attached pulleys, over which pass ropes which lead to shafts provided with ratchet wheels and cranks, and secured to the side of the post. To the other ends of the ropes are attached hooks, to receive the eyes of the bails, two of which are connected with the ends of each rope. For raising a hay rack, the four ends of the two bails are connected, and the rack is raised by turning the crank. For raising a wagon body, a rectangular frame is attached with the four ends of the two bails. To the frame are pivoted four rods, the lower ends of which connect with the ends of the crossbars of the wagon body. By operating the crank shaft, the wagon body may all be raised together, and without disarranging any of its parts.

IMPROVED CAR FOR ONE-RAIL, RAILWAY.

David B. James, Visalia, Cal.—This invention consists of one line of broad-faced wheels in the center to carry the load, and small guide wheels to run each side of the rail on vertical axles projecting down from the car. These wheels serve to keep the carrying wheels on the track and to prevent the cars from overturning, and are made to grip the rail. The wheels are connected with a platform which just clears the rail, and the car is mounted on pivots arranged in the line of the wheels and supported on the platform, so that the load is balanced on the wheels, and the center of gravity is lowered. The guide wheels running against the sides of the rails move from and toward the rails, and are provided with springs to keep them in contact. The essential advantage claimed for this contrivance is the economy in the cost of the track that it affords, one rail only being required and that being of wood.

IMPROVED RATCHET STOP FOR WATCHES, ETC.

James D. McAnlis, Beaver Falls, Pa.—This is mainly designed as a substitute for the spring pawls for ratchet wheels in machinery in which strong springs have to be retained at one tooth of the wheel, so that the tooth click is liable to break and get worn. It consists of a ratchet wheel, in combination with one or more small pinions that slide in a recessed and toothed encircling frame, and allow the turning of the ratchets in one direction, while stopping them positively in the opposite direction.

IMPROVED RAILROAD JOINT.

Richard O. Keefe, Omaha, Neb.—This inventor proposes to use a short section of a rail between the rail ends when they separate by contraction, in order to tighten the joint. Duplicate bolt holes are made in the fishplate for shifting the fastening bolts, as may be required by the shifting of the holes in the rails.

NEW HOUSEHOLD INVENTIONS.

IMPROVED WINDOW-SHUTTER OPENER.

John R. Day, New York city.—This is a contrivance for opening fireproof shutters from the outside of the building in case of fire and the like. It consists of a spring slide bolt and hasp for fastening the shutters, contrived so that the hasp will hook on the bolt to fasten. The bolt may be drawn back by hand to unfasten the shutters from the inside. Also it can be drawn back from the outside of the building by a hand lever, with which it connects by rods and levers. Any desired number of fasteners are all connected to one lever, so that they can be opened. The lever is arranged in a lock-up case.

IMPROVED ELASTIC BLOCK FOR SPLITTING KINDLING WOOD.

John C. Hubbs, New York city.—The object of this invention is to furnish a block for splitting kindling wood, so constructed that wood may be split upon it while standing upon the floor without injuring the floor or jarring the room, and which, when not in use as a splitting block, may be used as a seat. The invention consists in a splitting block formed of two blocks, with interposed springs, guide pins, and flexible strips, and in the combination of a cover with the splitting block to form a seat. The splitting is done upon the top of the block, and the jar of the blow is received by the springs, so that the floor will not be jarred or injured.

IMPROVED CULINARY VESSEL.

Daniel J. Esser, Mauch Chunk, Pa.—The inventor states that this vessel is adapted to cook in a perfectly odorless and inoffensive manner. It consists of a sectional vessel with central bottom opening, closed top, and bottom supports, adapted to place different sizes of cooking vessels and broilers within the same.

IMPROVED ROCKING CHAIR.

Martin Schrenkelsen, New York city.—The object of this invention is to improve the construction of the rocking chair for which letters patent were issued to Charles Brada, October 20, 1874, to counteract the tendency of said chair to lean forward. This is done by rear springs arranged to counterbalance the front springs, the two sets of springs being coiled in opposite directions.

IMPROVED BIRD CAGE.

John D. Heins, New York city.—This improved cage is intended for mating two or more female birds with one male, and consists of close partitions, dividing it into two or more compartments. These partitions are provided with a passage and a sliding door, to be opened at will for allowing the male bird to pass out of one compartment into another when one female has gone on her nest. The partitions are made to rise and be supported a little above the tray in the bottom, for drawing it out for cleaning.

IMPROVED COMBINED IRONING BOARD AND TABLE.

James A. Geraghty, Newark, N. J.—This device is so constructed that, when the ironing board is required for use, it may be securely connected with and supported from the table, and, when not required for use, can be placed beneath the top of said table, so as to be entirely out of the way.

IMPROVED SASI HOLDER.

Henry Powelson, New Brunswick, N. J.—This is a combination of two rods and a cone-pointed screw with the sash and casing of a window. The screw is inserted between the inner ends of the bars, so that, by turning the said screw inward, it forces the latter outward, pressing their outer ends against the casing, and thus locking the sash in place.

IMPROVED HOT AIR FURNACE.

David Boyd, New York city.—By this invention, the heat is divided into two longitudinal compartments, one of which contains the pipes and flues that carry off the smoke and heated products of combustion, and the other compartment contains the fire pot and heating parts of the furnace, thus making two separate radiators. Each chamber is properly supplied with air to be heated, so that the whole capacity of both is utilized.

IMPROVED WASH BOILER.

Emmor M. Mallett, Westville, Mich.—In using the washer, when the steam begins to form, it forces the water up through the tubes to be discharged upon the clothes. The water passes down through the clothes, through the holes in the false bottom, through channels formed by plates to the bottom of the boiler, to be again forced up through the pipes, and be discharged upon the clothes.

IMPROVED WASHING MACHINE.

William Bymaster, Jamestown, Ind.—In using the machine, the clothes to be washed are placed upon a stationary rubber, and a sufficient quantity of soap and water are put in. The movable rubber is lowered upon the clothes, and the cover is secured in place. The operator then grasps a cross bar in his hands, and turns the rubber back and forth, which washes the clothes thoroughly.

IMPROVED BACK SUPPORT FOR BATH TUBS

Emil F. W. Eisenmann, New York city.—This consists of a back support, attached to lateral webbing suspended by straps from side rods of the tub, the support being adjustable along the supporting rods by stop pins.

NEW WOODWORKING AND HOUSE AND CARRIAGE BUILDING INVENTIONS.

IMPROVED GUIDE FOR SAWING MACHINES.

Harrison P. Taylor, Franklin A. Perdue, and Jeremiah M. Perdue, Minerva, Ohio.—This is a guide for sawing machines, planers, etc., which may be adjusted to vary the width, the bevel, or the taper of the work, without the use of a rule, square, line, or gage.

IMPROVED LADIES' WORK TABLE.

L. Frances Woodward, Woodstock, Vt.—This table has separate places for the various articles used for ladies' work, so that they may be at all times conveniently accessible. It is made of such a height as to be convenient for the seamstress while sitting upon a low sewing chair, and light, so that it can be readily carried from place to place.

IMPROVED SCHOOL DESK.

David I. Stagg, New York city.—This is an improved folding desk which shall be so constructed that the desk board may be turned into a vertical position, or turned over to lie against the front of the desk.

IMPROVED VELOCIPED.

Earl A. Wheeler, Sharon, Pa.—This invention consists in driving the large wheels of a three-wheeled velocipede by means of treadle mechanism that turns the axle, while end ratchets of the latter carry pawls on the wheels, and rotate the same in a forward direction.

NEW CHEMICAL AND MISCELLANEOUS INVENTIONS.

IMPROVED BAG HOLDER.

John T. Brown, Morrisville, Va., and Joseph Colbert, Fredericksburg, Va.—This invention consists of a hopper provided with hooks for the attachment of the bag and sliding upon the front surfaces of two ratchet-toothed uprights, against which it is held by two clips provided with flanges that rest against the rear surfaces of the uprights. To the upper clip are pivoted two detents which are pressed between the teeth of the uprights by springs attached to the lower clip. The upper portions of the detents form handles, by means of which their points are released from the teeth and the hopper raised or lowered. The uprights are fixed to a base piece, upon which the bag rests while being filled.

IMPROVED TERRET PAD.

John R. Basiger, Harrisonville, Mo.—This is made of a screw socket for a terret ring, with a recess for retaining the layer of the back band. There is also a base plate, with extension lugs, for being riveted or screwed to the back band. The device is adapted for animals used for heavy work.

IMPROVED MUSICAL TOP.

Ella N. Gaillard, New York city.—In this pretty and ingenious toy is placed a musical box, to the running gear of which stop mechanism is connected, which is released when the top begins to spin, allowing the musical box to play. When the power imparted by the act of spinning the top is exhausted, and the top stops, the stop mechanism resumes its duty, and the music ceases. The inventor states that bells or chimes may be used in place of the tongued plate of steel commonly used in musical boxes.

IMPROVED TOBACCO-CURING APPARATUS.

John B. Smith, Milton, N. C.—The tobacco leaves are strung on wires which are passed through the stems as the leaves are gathered. When full the wires are attached to frames. These, when loaded, are placed with their ends between guide studs of the curing house, and hoisted up to the position where they are to rest for drying by suitable tackle, and are secured by cross pieces. When sufficiently dried, the frames are let down and the leaves stripped off from the wires.