

**ENGINEERING INVENTIONS.**

Mr. James M. Thayer, of Randolph, Mass., has patented an improvement in elevators by which they will be stopped and prevented from falling should the hoisting apparatus break or in any manner become disarranged.

Mr. John H. Blake, of Batavia, N. Y., has patented a cheap rotary engine that consists of few parts and is economical in the consumption of steam. The invention consists of an adjustable abutment, and a spring and crank shaft for effecting the movement of the abutment, and a rotary valve of simple construction.

An improved pile driver has been patented by Mr. Joseph W. Putnam, of New Orleans, La. This invention relates to an improvement in the class of pile drivers which are adapted for use in the construction of railroads, being for that purpose mounted on a truck or platform car in such manner as to admit of lateral movement in the arc of a circle, so as to drive several piles successively without requiring any change in the position of the truck or car.

**Dika Bread.**

The following interesting note concerning the preparation of the dika or odika bread of Western Africa has recently been received from Dr. H. W. Bachelor, in the Gaboon, by Mr. Thomas Christy, to whom we are indebted for it:

"The plums are gathered as they fall from the tree, and are emptied from the baskets one after another until a large heap is formed. They are allowed to remain many days until the outside has putrefied, and then the nuts are cracked, the seeds or kernels taken out and smoked for many days. Then they are put into a large mortar and crushed into a homogeneous mass. The rays of the sun are now allowed to pour on the mass, which melts and is put into a mould. This mould is of the shape of a frustum of a cone, and the cakes vary in diameter from eight inches to a foot at the base. These will keep for six months."

Dr. Bachelor also makes the following interesting remarks with regard to the native medicinal plants of the country:

"The only way of ascertaining the properties of any product here is to ask the natives 'if it poisons goats,' or 'if the monkeys eat it,' and by direct experiment. The natives themselves know nothing of one medicine for one disease, and another for another. It is, in their opinion, the *witchcraft* that cures, not the leaf itself."

**LIFTING TACKLE.**

Every engineer, builder, and millwright knows the great importance that is attached to lifting heavy weights and fixing materials and machinery. It is no use for work to be properly finished if accidents happen in fixing. The young and inexperienced erector is frequently at a loss to know how and where to attach his ropes and other appliances to secure the best result, and, worst of all, no effort is made to teach him; he must rely entirely on his own observations. So well known is this ignorance with respect to lifting and hoisting in mechanical trades, that it is frequently stated, and often acted upon, that an old sailor makes the best erector. He is as nimble as a monkey on a pole or scaffold. We know very well that in our younger days we experienced considerable difficulty in obtaining information respecting knots, loops, and other rope fastenings.

No doubt all who have to do with the moving of machinery and other heavy masses will find the rope knots and fastenings shown in the engraving very useful. The information is not only useful when away from home in foreign countries, or away from the workshop, but it is useful in the workshop. The man who understands the use of rope tackle is a king among his fellows.

We have often thought that in these days of steam cranes and hydraulic jacks, men are not so ready in resources as they were many years ago. They trust too much to machinery and too little to themselves. They seem afraid to exert their real strength at the end of a rope. If we can only induce a few of our readers to study the art of lifting weights and encourage confidence in manual strength, we shall not consider our efforts to have been in vain. The various kinds of knots and loops are shown in the annexed engravings.

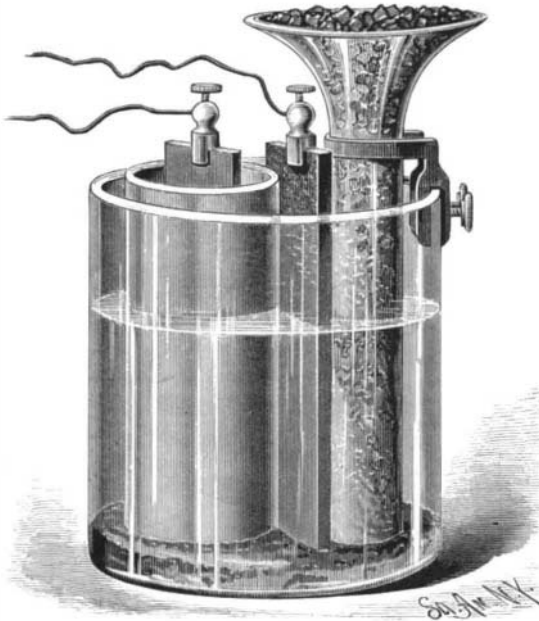
**The Fastest Time in a Trotting Match.**

On the closing day of the Jockey Club meeting, in Chicago, July 24, the best time ever recorded in an actual trotting match was made by the chestnut mare **Maid S.**, owned by

William H. Vanderbilt. The time was 2 m. 13½ sec. for the mile. Rarus has trotted in exhibition trials against time in 2:13¼ and 2:13½, and St. Julien in an exhibition trial in 2:12¾.

**IMPROVED GALVANIC BATTERY.**

In the battery shown in the engraving the ordinary zinc and carbon elements are employed, the zinc being placed in the porous cell and immersed in a solution of muriate of ammonia, and the carbon in oxalate of chromium and potash in combination with free bichromate of potash and muriatic acid.



**ANDERSON'S GALVANIC BATTERY.**

The negative portion of the cell may be charged in various ways, as for instance, by placing in the muriatic acid any oxalate, such as oxalate of copper or of ammonia, and adding bichromate of potash, whereby oxalate of chromium and potash is more or less quickly formed in the cell: but the mode the inventor has found advantageous to adopt is to add oxalic acid to a solution of bichromate of potash until effervescence ceases, and then to slowly evaporate the solution, whereby crystals of the oxalate of chromium and potash will be obtained. A sufficient quantity of this salt is then placed in the bottom of the carbon cell, together with about an equal quantity of crystals of bichromate of potash and muriatic acid, either pure or more or less diluted with water, according to the strength of the solution required, and the carbon is then placed in this solution. Instead of dropping the crystals or other agents loosely into the cell

the power of the battery, as more crystals are then exposed to the action of the solution. In this way, by adjusting the depth to which the tube is immersed the strength of the battery is regulated.

For a one-fluid battery the oxalate of chromium solution is common to both zinc and carbon. Arranged in this way the action of the battery, although of much shorter duration than when two fluids are used, the battery will be rendered much more intense, and the internal resistance of the cell will be less. The two-fluid form of battery is employed where great constancy, combined with a certain degree of power extending over a considerable period of time, is required, as, for instance, for telegraph work, the ringing of electric bells, and for the driving of electro-motors and the production of the electric light. On the other hand, the one-fluid form of battery may be used with advantage for purposes where a short, steady, and powerful action is required.

To prevent the escape of the fumes usually arising from the acids the solutions are covered with a film of oil or with a layer of finely powdered charcoal.

This battery was recently patented in the United States by Mr. Robert C. Anderson, of Woodgreen, England.

**NEW INVENTIONS.**

Messrs. Jacob Hollinger and John Flinner, of Millersburg, O., have patented improvements in that form of gate which, instead of swinging horizontally on hinges, is fixed upon a horizontal pivot bolt at one end between two posts, and is connected with rods and levers, whereby the gate is turned vertically over on its end when it is to be opened.

Mr. George K. Shryock, of Johnstown, Pa., has patented a dinner bucket the cover of which is provided with a glass lined sauce holder, preferably made in cup-shaped sections, which are made removable.

Mr. John Clayton, of Brainerd, Minn., has patented an improvement in rolling colters, which has for its chief object the exclusion of dust and dirt from the friction surfaces, thereby preventing wear of the journals, so that the durability and efficiency of the colter, as a whole, are increased. The inventor also provides for taking up such frictional wear as is unavoidably incident to use, and for supplying lubricant to the friction surfaces.

Mr. Jacob Katzenberg, of New York city, has patented an improvement in the class of suspenders in which a cord is combined with shoulder straps by means of pulleys or sliding attachments, so as to allow the free movement of the button pieces, and thereby accommodate the movements of the body of the wearer.

Mr. Thomas Ragan, of Philadelphia, Pa., has patented a non-freezing hydrant that can be disconnected from the water main and removed for repairs or other purpose without digging or excavating about it.

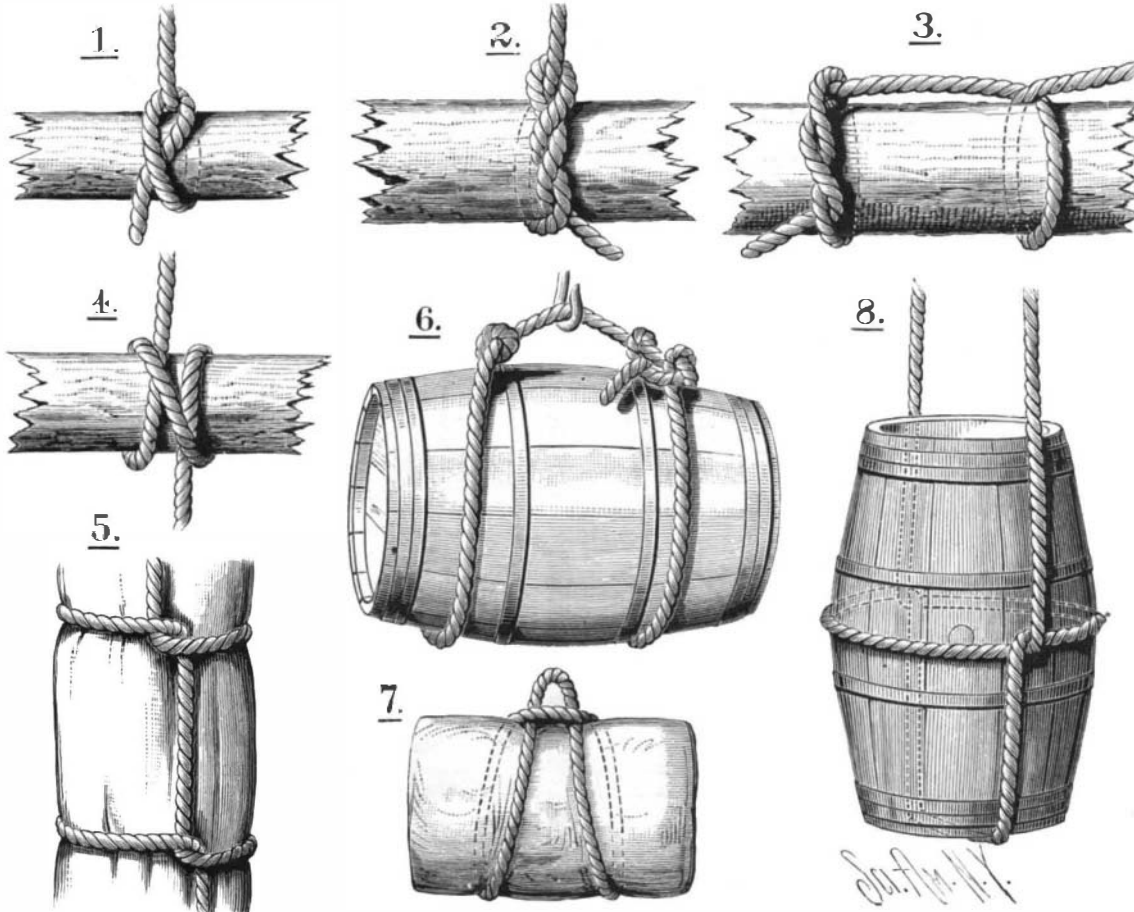
Mr. George Milbank, of Chillicothe, Mo., has patented an improved method of reducing grain or other substances, consisting, essentially, in subjecting the material under treatment to the action of reducing disks and an air current simultaneously, the air current passing between the disks and conveying the reduced material in opposition to the centrifugal action.

A metallic awning, so constructed that it may be folded compactly against the front of buildings and readily extended, has been patented by Mr. Wm. P. Woodruff, of New York city. The invention consists in a set of overlapped top strips, sets of overlapped end strips, and connecting and suspending chains and rod.

Messrs. Nicholas C. N. Laurence and Ernest G. Matzka, of Detroit, Mich., have patented a process of applying gilding or bronzing powders to mouldings, consisting, first, in mixing the gilding or bronzing powder with a solution of chlorine, alcohol, turpentine, diluted acetic acid, or any liquid compound with which the powder can be incorporated; in then adding thereto glue, isinglass, gelatine, or other soluble adhesive substance, and in then applying the mixture with a brush.

Mr. Henry Hartman, of Salt Lake City, Utah Terr., has patented an improved bridle, which is so constructed that horses can be easily and quickly controlled should they become frightened or attempt to practice ugly or dangerous tricks.

A novel device that may be attached to sewing machines for plaiting the fabrics to be sewed in plaits or folds of any desired width or any desired distance apart, has been patented by Mr. Leopold Lyon, of Hazleton, Pa.



Figs. 1, Half Hitch. 2, Timber Hitch. 3, Half Hitch and Timber Hitch. 4, Clove Hitch. 5, Hammock Hitch. 6, Cask Sling. 7, Bale. 8, Butt Sling on End.

**LIFTING TACKLE.**

containing the negative solution, as has been generally the practice, the strength of the battery is regulated by inclosing the crystals of bichromate of potash in an adjustable glass tube, open at the top and having a bottom of perforated platinum or of platinum wire gauze, or the tube itself may be perforated either at the bottom or sides. This tube is immersed in the negative solution to a greater or less depth. The greater the depth of immersion of the tube the stronger

An improved pianoforte attachment, by which the performer is enabled to sustain or permit the continuance of the sound of one or more strings after the fingers have been taken from the keys, has been patented by Mr. Carl Mahling, of New York city.

An improved safety whiffletree has been patented by Mr. Bolivar J. Quattlebaum, of Ridge, S. C. The object of this invention is to provide means for releasing horses from vehicles that may be instantly and conveniently operated in case of imminent danger, when it is desired to arrest at once the movement of the vehicle and the speed of the horse cannot be checked in time to avert the danger; and it may be used at any time for conveniently unhitching the horse from the vehicle by timid and unskilled persons, and at the same time provide against the accidental displacement of the trace from the end of the whiffletree.

Mr. William R. Parks, of Palmer, Mass., has patented a boiler which will heat water and make steam rapidly with a small amount of fuel.

An improved signal conveyer for hotels and other buildings has been patented by Mr. Joseph C. Beard, of Pine Bluff, Ark. The apparatus consists of a system of tubes leading from the different rooms to a common tube terminating at the office, and balls numbered to correspond with the numbers of the rooms, the messages being on the inside and being impelled by gravity. The pipe which conveys the balls descends continuously through the various rooms of the building to the office, and has an opening in each room. The box in which the balls are received contains a signal bell.

A self-closing faucet, that will close without spring or screw, has been patented by Mr. Thomas H. Walker, of Kansas City, Mo. The invention consists in a combination of devices that cannot be clearly described without engravings.

Mr. Elijah S. Caswell, of Taunton, Mass., has patented an improved shoe or boot nail, having the oblong head and a point beveled equally on both sides, and provided with lateral projections a short distance from the head.

A diagram for the use of draughtsmen in making perspective sketches or drawings, whereby such drawings may be made in true perspective and to scale in every part, has been patented by Mr. Emery M. Hamilton, of New York city. The invention consists in a diagram sheet having printed upon it guide lines in perspective and vertical and horizontal lines, the result of these combined lines being that the sheet is laid out in perspective scales, which can be utilized as guide lines for making a drawing at any angle to the horizon and vertical.

Mr. Charles F. Linscott, of Boston, Mass., has patented an improved glass plate cleaner, which consists of a head or holder and one or more rubber strips made thicker at one edge, with one side flat and the other side concaved from the thicker edge to, or nearly to, the thinner edge.

Mr. Edward Weissenborn, of Jersey City Heights, N. J., has patented an improved package for pencils, crayons, and similar articles, so constructed as to prevent the pencils or other articles contained in the packages from rubbing against each other.

An apparatus by means of which, with the aid of water and certain chemicals, the dry air of high altitudes may be made to resemble the moist air of low altitudes, has been patented by Mr. Henry R. Fowler, of Leadville, Col.

Mr. William F. Phillips, of Watford, Ontario, Canada, has patented a swing, having two pairs of crossed posts, strengthened by cross bars, a cap box, and branched swinging bars, from which is suspended a basket.

Mr. Edward J. McClellan, of Brooklyn, N. Y., has patented a device that may readily be attached to a pan for use in mixing and kneading dough for bread and cake. The invention consists in an adjustable bar or plate fitted with a clamping screw and carrying the mixer and gearing. The mixer consists of an arbor or staff provided with radial arms and fitted with eccentric gearing, whereby both a revolving motion and up-and-down movement may be given to the staff.

Mr. Alfred N. Gabel, Sr., of Ridgeville, Ill., has patented a fertilizer distributing attachment for planters for distributing fertilizers in hills or drills and in any desired quantity.

Mr. Benjamin J. Howe, of Sing Sing, N. Y., has patented an improved dish washer, by which, the inventor claims, as many dishes can be washed and thoroughly cleansed in five minutes as can be done by hand by one operator in an hour.

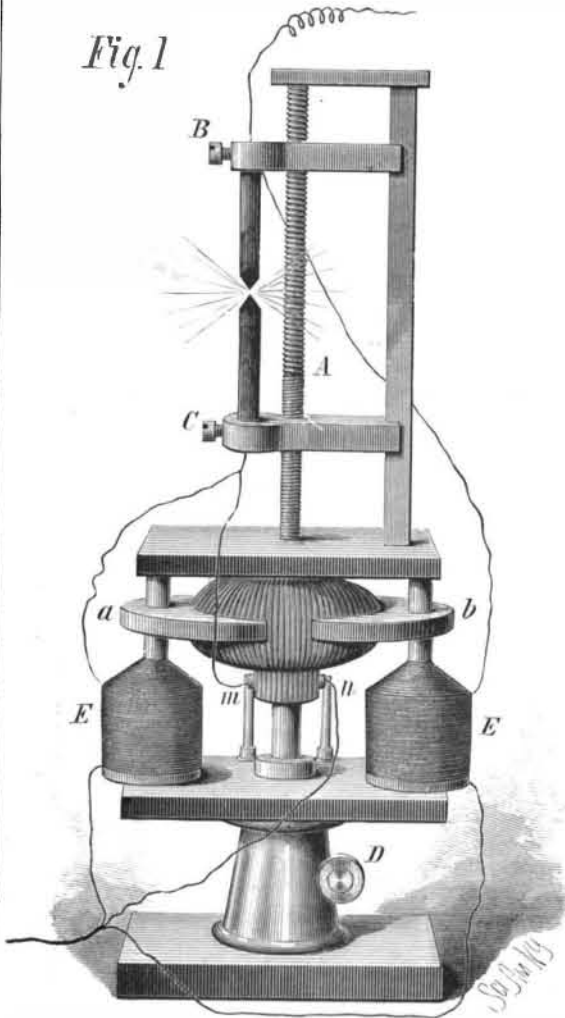
Mr. Thomas F. Longaker, of West Philadelphia, Pa., has patented an adjustable gauge for liquid measures, which consists in providing the measuring attachment with a device for adjusting the attachment for measuring liquids of different specific gravities, and also in so constructing the discharge valve that the packing may be renewed by unscrewing the valve seat.

The combination of a bench hook or screw, fitted in the table, with a swinging frame and clamping jaw or vise, has been patented by Mr. Nathan E. Lovejoy, of Columbus, O.

Mr. William N. Crabtree, of Porterville, Cal., has patented an improvement in hair trigger gun-locks, which consists in devices that will prevent accidental discharge of the gun without requiring additional manipulation or interfering with the rapid handling of the piece. A blocking piece is interposed between the hammer and breech, to prevent contact of the hammer with the cap tube, and a thumb lever fitted upon the hammer holds the blocking piece out of action when the hammer is set for firing. These devices work automatically by the usual manipulations of the hammer.

#### THE ELECTRIC LAMPS OF W. TCHIKOLEFF.

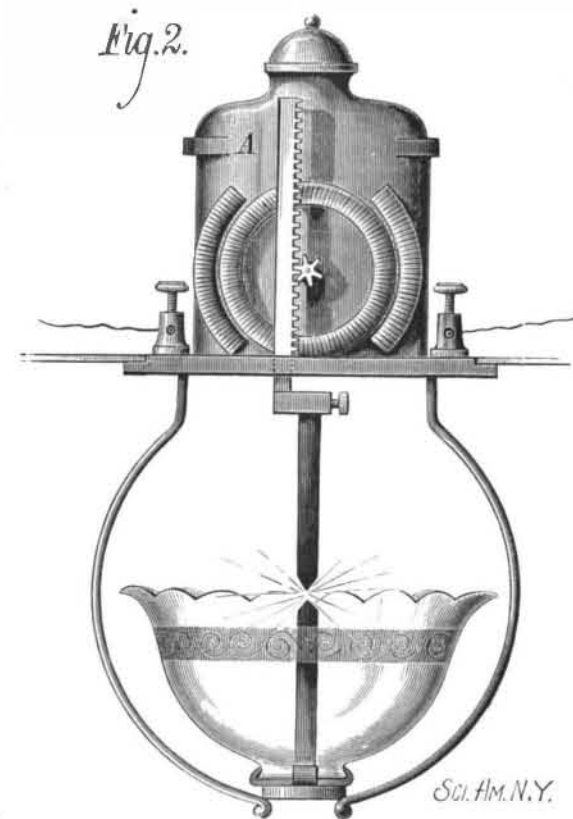
W. Tchikoleff, the head of the electric lighting department of the Russian artillery, has described, in *La Lumière Electrique*, a new lamp, the design of which was lately brought before the physical section of the Moscow Society of Naturalists, and which is represented by Fig. 1.



TCHIKOLEFF'S ELECTRIC LAMP.

E E' are electro-magnets disposed like those on the other systems, and having poles, *a b*, spread out in circular form as in the Gramme machine. K is a Gramme or Siemens ring, the rotary motion of which causes the carbons to move through the intermediary of a double thread screw, A, and two nuts, B C, which carry the carbons. Lastly, D is a regulating screw, for the purpose of raising or lowering the luminous focus.

The current passes from the positive pole of the generator to the negative pole by three derivations, one of which includes the arc and traverses the ring by means of the contact pieces, *m n*; while a second, also including the arc, ex-



TCHIKOLEFF'S NEW LAMP.

cites the electro-magnet, E (or both electro-magnets in a given direction); and a third which, without passing by the arc, influences the high resistance magnet, E' (or both magnets in contrary directions), so that the action of this magnet upon the ring shall be in a reverse direction to that of E.

In consequence of this arrangement the action of the electro-magnets upon the ring, K, is almost nil when the arc possesses its normal resistance; but when the resistance of

the arc augments, the action of the electro-magnet, E, becomes weakened, allowing E' to preponderate, and the ring, K, will rotate so as to bring the carbons into closer proximity. The contrary effect will, of course, be produced if the resistance of the arc should diminish.

Experience has shown that with such a lamp it is possible to obtain, with regularity and safety, a good electric light with twenty-four Bunsen cells, and at first with even twenty cells. Some of these lamps have been in use in the Russian artillery since 1877. This lamp may also be constructed on the principle of the Wheatstone balance.

The form of this lamp intended for public lighting is represented by Fig. 2. The rod, A, with the upper carbon holder, works by the effect of its own weight. When the current traverses the lamp the distance between the two carbons is maintained by the aid of helical coils, but these coils and the toothed wheel which controls the movements are worked, as in the former case, on the principle of derivations. When the current is interrupted, the carbons come into contact by the effect of the weight of the rod, A.

Certain details of construction have been omitted in this description, but enough has been given to make the principle clear.

To sum up, the advantages of this lamp may be enumerated as follows:

1. Its construction is extremely simple; it is free from clockwork mechanism, springs, and electrical contacts.

2. It does not require preliminary regulation nor any manipulation before or during its working.

3. Several of these lamps may be arranged in series in a circuit, and they are always in due relation with the intensity and the tension of the current which is to act upon them.

4. The lamp can work with comparatively weak currents, and also produce a very powerful light when the power of the current is augmented.

The inventor is convinced that the problem of the divisibility of the electric light by means of lamps having a voltaic arc can be solved only with the lamps based on the principle of the derivation of the current, which he discovered prior to Messrs. Lontin and Siemens.

Lamps with movable carbons, offering a certain resistance between their polar extremities, are, moreover, far preferable, from the point of view of divisibility, to lamps with fixed carbons, which may offer great variations in the resistance of the arc, in consequence of impurities, the action of the wind, etc. These variations may, in fact, be greatly reduced in the former description of lamp, and it is not necessary with them to employ currents of such high tension, or, if such currents be employed, additional lamps may be inserted in the circuit.

#### DECISIONS RELATING TO PATENTS.

##### U. S. Circuit Court—Southern District of New York.

COLLENDER *vs.* GRIFFITH *et al.*—BILLIARD TABLE PATENT Blatchford, J.

1. The fact that a mechanical patent was issued more than two years after the date of a design patent showing, but not claiming, a like invention, will not invalidate the former.

2. A billiard table having the broad side rails made of beveled or inclined planes shows sufficient utility and advantage in the way of cheapness of construction, as compared with a table having sides of curved or ogee form, to support a patent.

3. Reissued letters patent No. 6,469, granted to H. W. Collender, June 1, 1875, for an improvement in billiard tables, declared invalid in view of evidence showing the existence in this country of similar tables many years prior to the date of the patent.

##### United States Circuit Court—Western District of Pennsylvania.

KNEELAND *et al.* *vs.* SHERIFF *et al.*—PISTONS FOR DEEP WELL PUMPS.

McKenna, J.

1. Patent No. 53,630, granted April 3, 1865, to E. Y. Kneeland, for improvements in pistons for deep well pumps, sustained.

2. "A patentee whose patent is assailed upon the ground of want of novelty may show by sketches and drawings the date of his inventive invention, and if he has exercised reasonable diligence in perfecting and adapting it and in applying for a patent, its protection will be carried back to such date." (*Reeves vs. Keystone Bridge Company*, 1 O. G., 466.)

##### U. S. Circuit Court—Southern District of New York.

WILLIAMS *vs.* BARKER *et al.*—WILLIAMS' PATENT RUBBER FLOCK MACHINE, PATENTED NOVEMBER 26, 1861.

Wheeler, J.

When the several elements of a patented machine differ from a prior machine only as to the form of certain parts common to both, the patent, in order to be sustained, must be restricted in scope to the improvements in the form of such parts.

Bill dismissed.

##### U. S. Circuit Court—Northern District of New York.

MAYNARD *vs.* PAWLING *et al.*—PATENT RADIATING CONDENSER, ISSUED JANUARY 30, 1877.

Blatchford, J.

Where the device sold by the defendants is capable of use independently of a feature necessary to the plaintiff's apparatus, and it does not appear that the defendants intended