(loss of weight, 13 56 grains) only slightly by chloride of magnesium (0·075 grain), and alkaline chlorides (0·06 grain), extremely little by distilled water (0·015 grain), not at all by sulphate of potassa, saltpeter, carbonate of soda, caustic soda, or lime water. Quite a considerable amount of copper was dissolved by sal ammoniac, only traces of it by distilled water; none of the other solutions were able to convert any copper into soluble compounds. In the presence of carbonic acid, the copper was attacked by all the solutions, most violently again by sal ammoniac (loss, 2·14 grains), the action being only about one sixth of that without carbonic acid. The alkaline chlorides dissolved 1·76 grains, chloride of magnesium, 1·72 grains, being nearly as strong as sal ammoniac. Sulphate of potassa acted feebly (0·060 grain), and so did saltpeter (0 045 grain) in distilled water (0·045 grain). All these solutions dissolved perceptible quantities of copper.

Zinc, in the absence of carbonic acid, was attacked by every solution, most violently by caustic soda (loss 0·90 grain) and sal ammoniac (0 76 grain), considerably by sulphate of potassa (0 045 grain), less by chloride of magnesium, distilled water, and carbonate of soda (0·195 grain), quite feebly by saltpeter (0 135 grain) and alkaline chlorides (0·105 grain), inconsiderably by lime water (0 045 grain). Perceptible quantities of soluble zinc compounds are produced by the action of caustic soda, sal ammoniac, and chloride of magnesium; traces only by distilled water and lime water. None of the other solutions produced soluble zinc compounds. In the presence of air and carbonic acid, all solutions act upon zinc; chloride of magnesium acts the strongest (loss 0·810 grain); next to it, sulphate of potassa (0 795 grain). The alkaline chlorides act considerably (loss 0·57 grain), and almost equally with saltpeter (0 555 grain) and sal ammoniac (0·54 grain); distilled water less (0·285 grain). Perceptible quantities of zinc were dissolved by each solution.

Lead, in air free from carbonic acid, was very strongly attacked by caustic soda (loss, 6 45 grains); considerably by lime water (2·055 grains); less by alkaline chlorides (0·315 grain); chloride of magnesium (0·3 grain); saltpeter (0 21 grain), and sal ammoniac (0·18 grain); still less by distilled water (0·045 grain); and not at all by sulphate of potassa and carbonate of soda. Caustic soda, lime water, and sal ammoniac converted perceptible quantities of lead into soluble compounds, chloride of magnesium and distilled water only traces of it; while sulphate of potassa, carbonate of soda, saltpeter, and alkaline chlorides dissolved no lead. With access of carbonic acid and air, the chloride of magnesium acted most strongly (loss, 0·525 grain); next saltpeter (0 31 grain) and alkaline chlorides (0·18 grain); still less distilled water (0·12 grain) and sal ammoniac (0·075 grain). Sulphate of potassa was again powerless to affect the lead, and did not dissolve a trace of it, while all the other solutions dissolved perceptible quantities of it.

Tin, in the absence of carbonic acid, was energetically attacked only by carbonic soda (loss, 0·33 grain). Of the other solutions, it lost, in carbonate of soda, 0 105 grain; in alkaline chlorides, 0 90 grain; in sal ammoniac, 0·075 grain; in saltpeter, 0 045 grain; in sulphate of potassa, 0 03 grain; and in chloride of magnesium, 0·015 grain: while it was unaffected by distilled water and lime water. Only caustic soda and carbonate of soda were able to dissolve perceptible quantities of tin. Carbonic acid and air hinder, in a remarkable manner, the action of these solutions upon tin, with the single exception of saltpeter, which acts very faintly (loss, 0 015 grain).

Britannia metal acts quite analogous to tin. In air free from carbonic acid, caustic soda acts most violently (loss of weight, 1·41 grains); the others act inconsiderably. The loss of weight in alkaline chlorides was only 0·135 grain; in carbonate of soda, 0·09 grain; in sal ammoniac, 0·045 grain; in sulphate of potash, chloride of magnesium, and saltpeter, each only 0·015 grain; and in distilled water and lime water, it was unacted upon. Caustic soda and carbonate of soda alone dissolved perceptible quantities of the metal. In the presence of carbonic acid and air, as in the case of tin, distilled water, sal ammoniac, and sulphate of potassa do not act at all; the alkaline chlorides, chloride of magnesium, and saltpeter act very feebly (loss, 0·015 grain); and saltpeter alone dissolves enough metal to be detected.

Brass acts, on the whole, in a manner analogous to copper. With access of air free from carbonic acid, it is strongly attacked by sal ammoniac (loss of weight, 4·035 grains), only slightly by chloride of magnesium (loss, 0·6 grain), alkaline chlorides, caustic soda, and lime water (each 0·03 grain), and not at all by distilled water, sulphate of potassa, saltpeter, and carbonate of soda. Perceptible quantities of metal are dissolved by sal ammoniac and chloride of magnesium, and traces of it by caustic soda and lime water. In the presence of carbonic acid and air, it is acted on most violently by sal ammoniac (loss, 2·505 grains) very strongly; by chloride of magnesium (loss, 1·38 grains), and alkaline chlorides (loss, 1·2 grains); less by distilled water and carbonate of potassa (each 0·06 grain), and saltpeter (loss, 0·045 grain). All the solutions dissolved perceptible quantities of the metal.

German silver acts like brass, but on the average is less energetically attacked. In air free from carbonic acid, it is less strongly attacked than brass, although quite strongly by sal ammoniac (loss of weight, 0·129 grain), less by chloride of magnesium (loss, 0·045 grain), alkaline chlorides (0·015 grain), and caustic soda (0 15 grain), not at all by distilled water, sulphate of potassa, saltpeter, carbonate of soda, and lime water. Perceptible quantities of metal were dissolved by sal ammoniac and chloride of magnesium; traces only by caustic soda. In carbonic acid and air, the sal ammoniac acts the strongest (loss, 1·74 grains), next to this are chloride of magnesium (1 005 grains), and alkaline chlorides (0·915 grain), still less distilled water, sulphate of potassa, and saltpeter (each 0 015 grain). Perceptible quantities of metal are dissolved by all these solutions.

Copyrights.

Mr. Rowland Cox, says: In the case of Lawrence *vs.* Cupples, Judge Shepley has announced it as his opinion that, in an action for the infringement of a copyright, where the resemblances are accidental or arise from the nature of the subject treated in the two books, there can be no recovery. To constitute an infringement of a copyright, the learned judge says, there must be piracy; the defendant must have used the plaintiff's book as his model. Although the defendant's work cover the same ground as the plaintiff's, and answers the same purpose *in toto*, it will be no infringement if it is not an appropriation of plaintiff's particular method Hence, where the plaintiff had compiled a book bearing the title "The Advertiser and Collector's Chart," containing certain lists and names, and defendant issued a book entitled "The New England Mercantile Guide," which contained the same lists, it was held that there was no infringement.

There can be no doubt that a copyright which purports inferentially to cover anything akin to a subject is of no avail. It is idle to attempt to make a copyright effect, directly or indirectly, the functions of a patent or a trademark. The three are possibly of the same genus, but, as species, are widely separated; and to confound them inevitably leads to illogical conclusions.

The Comacho Electric Machine.

The Comacho magnetic machine, with its concentric iron tubular magnets, may be seen at 171 Queen Victoria street. There can be no doubt of the advantage of this form of magnet; but experiment on the resistance of the circuit, weight lifted, electro-motive force, and consumption of zinc, etc., would form an interesting subject. The machine, with five cells of a bichromate battery, works three or four sewing machines. Attempts to work it with the thermopile have hitherto failed. This is very likely, because the elements of the thermopile are coupled up in considerable series, so that, considering the resistance of each element, the whole resistance must be great compared with the resistance of the wire round the magnets. A thermopile should be made of low resistance by coupling a number of elements together in parallel circuit, and then taking some ten or twelve, or more, of such series coupled in succession. It is no doubt worth considerable experiment to attain a successful result from the thermopile, as in that case, by merely turning on the gas, a lathe or sewing machine be made to work.—*Telegraphic Journal.*

Rotary Engines.

According to the invention of Mr. Urbain Chauveau, of Paris, a cylinder is arranged with a piston which may be actuated by steam, compressed air, or gas, so as to move round an axis passing through a center. If a point of the piston rod is forced to move in the space of a fixed circle having for its center a given point, so that the distance is equal to one half of the stroke of the piston, it will be readily understood that the alternate motion of the piston in the cylinder will produce a continuous rotary motion of the said cylinder round the axis. Different arrangements of mechanical parts may be employed to carry out the principle abovementioned, and the construction of rotary engines of this character may be varied to a great extent, and yet in accordance with the same principle. The admission of steam may be made in any ordinary manner.

Drilling and Boring.

An invention by Mr. J. Dodge, of Manchester, England, consists in an improved compound machine, by which four or other convenient number of holes can be drilled or bored at the same time, and by which the spindles of the drilling or boring tools at opposite sides of the machine are set simultaneously, and in unison with each other. His improved machinery consists of a foundation plate, and of four standards, which are connected by crossslides supporting the boring headstocks; the cross slidesare raised or lowered, and the boring headstocks are traversed to and fro on the cross slides by screws, all of which are connected together.

Large Lap-Welded Tubes.

The National Tube Works Company have just completed, at their works at McKeesport, Pa., a sample pipe for exhibition at the Centennial. It is 14 feet in length and of 14 inches outside diameter and 10 inches inside, the iron of which it is made being 2 inches in thickness. This is said to be the heaviest piece of lap-welded pipe ever made in this or any other country, and it is stated that such heavy work has never been attempted by any other establishment.

The Hell Gate Obstructions.

The drilling of the chief obstruction at Hell Gate is finished, and the machines have been transferred to Flood Rock. The *débris* have been cleared away from the shaft, and the caves formed by the deep headings are now in a good condition to be explored. Experiments are being made daily in explosive material, to ascertain the safest. The mine will be sprung next July or August. There are 172 pillars which support the rocky roof; 8,000 borings have been made for inserting explosive matter. Those in charge of the work apprehend more danger from the surging of the water than from the shock at the time the rock is shattered. The work at Flood Rock is carried on day and night.

A New Electric Battery.

M. Cerpaux proposes a battery made of a certain number of plates of copper and of zinc separated by a wooden lath. The plates are plunged in sand or moist earth, and an electric current is at once produced. If on the earth chloride of sodium be poured, a very intense current is generated.

Steam Street Cars in Philadelphia.

Steam street cars are now in operation on one of the railroad lines in Philadelphia. The local papers state that the objection that horses will be frightened by the exhaust has not been realized, as no runaways have occurred, nor do the animals seem at all alarmed by the proximity of the machines.

DECISIONS OF THE COURTS.

United States Circuit Court---District of Massachusetts.

PATENT SHADE FIXTURES.—STEWART HARTSHORN *vs.* JOHN SHOREY *et al.*

[In equity.—Before SHEPLEY, J.—Decided October term, 1875; to wit, February 17, 1876.]

SHEPLEY, J.:

This bill is for an alleged infringement of letters patent No. 2,756, dated August 27, 1867, granted to Stewart Hartshorn for improvement in spring fixtures for shades. These are the same letters patent which were the subject matter of litigation in Hartshorn *vs.* Almy, and Hartshorn *vs.* Tripp *et al.*

Defendants rely upon two grounds of defense:

First, that the alleged invention of Hartshorn was not new and patentable at the date of his original letters patent.

Second, that the devices made use of by the defendants are no infringement of the plaintiff's invention.

To sustain the defense of want of novelty, the defendants rely upon evidence of the prior existence of what is well known as the coach fixture, in which a cord is used to lift the pawl and disengage it from the ratchet when it is desirable to allow the curtain to roll up under the action of the spring. This defense is fully met and answered in the two cases above cited, to which it is only necessary to refer to dispose of this branch of the defense.

The fixture manufactured by the defendants has a spindle which rests in the bracket, and is extended for a short distance into one end of the curtain roller, which end revolves around that portion of the fixed spindle which is projected into the roller, while the other end of the roller is provided with a journal, upon which it revolves freely in the supporting bracket. This spindle is provided with a cam-shaped recess on one side of it, within the roller, and a chamber of sufficient size to receive a small sphere or buckshot in such a position as to be directly over the recess in the spindle when the roller is revolved. The small ball or buckshot is introduced into this chamber. One edge of the recess in the spindle is so constructed that when the ball falls into the recess it will be forced against the side of the chamber, and operate as a detent to stop the revolution of the roller when it is turning one way. The other edge of the recess is so formed that when the roller is turned in the opposite direction the ball is thrown up into the chamber, where, when the roller is rapidly revolved, the ball is held by centrifugal force.

It will be seen, by a comparison of this contrivance with the one described in the Hartshorn patent, that it effects the same result by means of the ball operating as a detent as is effected in the Hartshorn contrivance by the pawl and ratchet In Hartshorn's, the pawl has a tendency to fall by gravitation into the notches made in the periphery of the hub, or when fixed below the hub, in one of the modes described in the patent, it is actuated by a spring which tends to engage it in the notch. The ball operates as a detent, catch, or pawl, to engage with the notch or ratchet whenever the rotation of the roller, and the upward movement of the curtain under the influence of the spring, are checked by the manipulation of the curtain or shade itself. In Hartshorn's, when the roller is revolved rapidly, the ratchet has not time to fall by gravitation into the notch while the ratchet notch is passing under the toe of the pawl. In Shorey's, while the roller is being rapidly revolved, the ball is kept by centrifugal force from engaging as a detent between the side of the chamber in the roller, and the edge of the recess in the spindle.

The construction of the claim in the Hartshorn patent was fully given in the case of Hartshorn and Almy. It was there shown to embrace, in combination with a spring roller, such an arrangement of pawl and ratchet, with the varying speed of the revolution of the roller mutually acting with each other through the manipulation of the roller, that the pawl would engage with the ratchet by checking the rotation of the roller and the upward movement of the curtain by the simple manipulation of the shade, merely varying the speed of the rotation of the roller. It is equally within the scope of this invention, whether the force which determines the fact of engagement or non-engagement of the pawl or detent with the notch or ratchet be that of a spring, or force of gravity, or centrifugal force.

Improvements may be made in the spring or the roller, the shade, or the form of the pawl or detent, and these improvements may be patentable; but so long as the combination embraces, as in the case of the device of these defendants, every element of Hartshorn's invention, operating substantially in the same manner to produce the same result, it must be treated as an infringement.

Decree for complainant, for injunction and account.

[*S. D. Law*, for complainant.

A. K. P. Joy, for defendant.

Inventions Patented in England by Americans.

[Compiled from the Commissioners of Patents' Journal.]

From February 29 to March 27, 1876 inclusive

APPLYING MOTIVE POWER.—J. Doubler, Philadelphia, Pa.
BAKING POWDER.—Dodge *et al.*, New York city.
BARBED FENCE WIRE.—H. W. Putnam, Bennington, Vt.
BOILER.—D. L. M. Moore (of New York city), London, England.
BOILER TUBE APPARATUS.—J. H. Faxon, New York city.
BOOT-SCREWING MACHINE.—American Cable Screw Wire Co., Boston, Ms.
BOOT-SEWING MACHINE.—D. Mills (of Brooklyn, N. Y.), Aston, England.
BRICK KILN, ETC.—G. S. Reddield, Chicago, Ill.
BRICK MACHINERY.—C. S. Bigler, Harrisburgh, Pa.
BRICK MACHINE.—W. A. Graham, Carlisle, Pa.
BURNING LIME, ETC.—A. Smith, Buffalo, N. Y.
CARDING MACHINE.—J. F. Foss, Lowell, Mass.
CLEANSING WHEAT.—D. M. Richardson, Detroit, Mich.
COVERING UMBRELLAS.—J. P. Onderdonk, Philadelphia, Pa.
CUTLERY.—J. Pedder *et al.*, Beaver Falls, Pa.
ENGINE VALVES, ETC.—H. E. Marchand, Pittsburgh, Pa.
FARE REGISTER.—J. Sangster *et al.*, Buffalo, N. Y.
FEEDING CARDING MACHINES.—W. T. Bramwell, Terre Haute, Ind.
FLUID METER.—J. C. Guerrant, Danville, Va., *et al.*
GASELIER.—C. Deavs, New York city.
HAY KNIFE, ETC.—H. Holt, East Wilton, Me.
HEAT RADIATOR.—E. C. Angell, New York city.
HORSESHOE MACHINE.—J. A. Burden, Troy, N. Y.
KNITTING MACHINERY.—C. J. Appleton, Elizabeth, N. J.
LIFE RAFT.—N. H. Borgfeldt, New York city.
LIGHTING GAS.—H. B. Stockwell *et al.*, Brooklyn, N. Y.
MACHINE GUN.—W. Gardner, Hartford, Conn.
MAKING GAS.—M. H. Strong, Brooklyn, N. Y.
MAKING LEATHER.—C. L. Royer, San Francisco, Cal.
MAKING PIG IRON.—C. Hildrod, Youngstown, Ohio.
MAKING STEEL.—W. Fields, Wilmington, Del.
MINER'S PICK.—J. I. Fewkes, Philadelphia, Pa.
PAPER BOX.—B. Osborn, Newark, N. J.
PHOTOGRAPH APPARATUS.—W. A. Brice, New York city.
PIANOFORTE.—C. E. Rogers, Mass.
PITH VENEERS.—S. H. Penley *et al.*
RAILWAY SWITCH, ETC.—J. S. Williams, Riverton, N. J.
ROLLER SHUTTER.—J. G. Wilson, New York city.
ROLLER SKATE.—C. H. Green, New York city.
SCREW WRENCH.—O. T. Bedell, New York city.
SEWING MACHINE.—G. L. Du Laney, New York city.
SOAP.—S. S. Lewis (of Boston, Mass.), London, England.
SUBMARINE TELEGRAPH STATION.—R. F. Bradley, Moffettsville, S. C.
TYPE-SETTING MACHINE, ETC.—S. W. Green, New York city.
VARNISHING METAL CASES.—F. A. Pratt *et al.*, Hartford, Conn.
VENTILATING MINES.—F. Murphy, Streator, Ill.
WASHING MACHINERY.—C. W. Littlefield, Boston, Mass.
WIRE BOOT PEG MACHINERY.—O. L. G. Noble *et al.*, Chicago, Ill.
WRINGER.—C. W. Littlefield, Boston, Mass.