

energy; besides, the slow current would be able to find sufficient copper in even a very dilute solution.

It is obvious, therefore, that solutions should be sufficiently supplied with metal for all likely requirements, and the stronger they are the more rapidly they are to be worked.

The other point to be studied is the relation of the current to the solution and to the work, and this the most important, because it is under control and is constantly varying with different objects. We have seen that there is a point so near balance that the extra strength of current concentrated on the edges destroys the coherence of the deposit. Now, if we arrange several vessels in series, all alike except in the difference in the area of the cathode in each, and connect them to a battery, we can produce such a condition of things that, by the same current and from the same solution, and with the same size of anode, we shall obtain every gradation of deposit, from brown loose powder to single hard crystals. Here, then, we find a relation between the quantity, or current, and the area over which it is distributed—a relation which is rarely pointed out with the definiteness required, for this is the fundamental condition of good working. Of course this is practically known, or there could be no success in depositing, but the principle can only be understood by a distinct conception of measurement and of the molecular relations of electricity.

This relation we may examine under the name of density of current, for which also we require a unit; this is conveniently furnished by the chemic unit of current and square inch of surface. We must therefore ascertain, by experiment, for any given solution, the range of density of current which gives good work. Such an experiment is made by using a cathode of a fixed area, so that by varying the battery power we can examine the different quality of deposit produced. Having thus ascertained the rate of deposit adapted to the solution, the density of current can be controlled by similar means in actual working, so as to secure the conditions of good working and the rate and quality of deposit we desire.

#### CHEERFUL FOR ADVERTISERS.

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We hope soon to be compelled by advertisers to make every regular issue of our journal of the same size.

Those who have advertisements in the Special will be gratified to know that we shall print of our first edition—now on the press—ONE HUNDRED AND FORTY-FIVE THOUSAND copies, and it is expected that the demand will be so great that a second edition of from 25,000 to 50,000 will be required.

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#### DECISIONS OF THE COURTS.

##### United States Circuit Court.—Northern District of Ohio.

CLOVER SEED MACHINE PATENT.—JOHN C. BIRDSSELL vs. A. McDONALD et al. JOHN C. BIRDSSELL vs. THE ASHLAND MACHINE COMPANY et al.

SWAYNE, J.

[April term, 1874.]

These are suits in equity founded upon certain patents issued to the complainant, touching machinery for getting out clover seed. Except in one particular, hereinafter mentioned, the bills in both cases contain the same allegations.

The parties agree as to the state of the art down to the period of the alleged inventions of the complainant.

Before that time clover heads were detached from the stems, preparatory to hulling, by the tramping of horses, by thrashing with flails, by cutting with cradles (the two first fingers being covered with canvas and the flails cut off near the place of their attachment to the stems), by removing the heads in the field by an instrument known as a stripper, and, after mowing, by ordinary thrashing machines. The heads were also sometimes detached by a machine designed especially for that purpose. Hulling out the seed was a distinct process. This was usually done by a machine used for that purpose alone. Machines for thrashing and those for hulling were frequently worked at the same time side by side.

The complainant's bill against McDonald and others is founded upon two patents, reissue No. 1,239, and the original patent, No. 35,209. The bill charges the defendants in that case with infringing all the claims, three in number, of the reissue, and the third claim of the original patent.

A defence cannot be charged with having abandoned his invention because his solicitors, without his knowledge, neglected to file his application in the Patent Office, for more than two years after it had been sworn to, and was in all respects complete.

An invention will not be held forfeited because it was used for experimental purposes, in good faith, more than two years before applying for a patent. The objection is not one to be regarded with favor; but, if clearly established, it is fatal.

It is presumed, from the decision of the Commissioner of Patents, in granting a reissue, that it embraces the same invention as the original patent; and the contrary can be shown only by a comparison of the papers in the two cases.

A reissued patent can only be impeached for fraud by a bill in equity brought for the purpose by the Government.

A combination is legitimate when all the elements cooperate in producing a result, and are necessary to it, though their several functions are not performed simultaneously; if performed in immediate succession, it is sufficient.

If an alleged invention proves superior to what has been known before, it is evidence in favor of its novelty.

A clover machine with two hulling cylinders does not affect the validity of a subsequent patent for a machine for one cylinder for thrashing and another for hulling.

Machines which have been abandoned after being experimented upon do not prejudice a subsequent patent for a successful machine, however closely they resemble each other.

[S. S. Fisher, for complainant.  
George Willey and George Rice, for defendants.]

#### Recent American and Foreign Patents.

##### Improved Sash Balance.

Newton J. Skaggs, Talladega, Ala.—By suitable construction a cord is pressed and clamped against the side bar of the sash by the downward movement of the block into the cavity of a plate. The block is raised to release the cord by means of a knob, the stem of which passes in through a vertical slot in the angle of the plate, and is screwed into the block.

##### Improved Running Gear for Wagons.

William H. Simmans, Memphis, Tenn.—This invention consists in connecting the reach to the front running gear by means of a tube through which the king bolt passes. The tube is secured to the axle independently, and thus relieves the king bolt of strain.

##### Improved Holding Jack for Wagon Bodies.

William R. Crane, Stony Creek, Mich.—This invention consists of a couple of rests for the support of a wagon body, mounted on a horizontal support, one being jointed and the other attached to it. Said support is mounted on the top of a standard, in which it is capable of turning on its axis. The standard turns on its axis, so that the box may be turned and shifted about, and presented and held in various positions for the convenience of the workmen in dressing, finishing, and painting it.

##### Improved Adjustable Dead Pulley.

Augustus Newell and Asa B. Cook, of Erie, Pa.; said Newell assignor to said Cook.—The loose pulley is entirely supported by the box, there being a space left around the shaft. The two arms of the double hanger are held against the sides of the box by means of a belt, which passes through the lower extremity of the said arms. The double cam of the shifting lever, as it moves the loose pulley in and out, presses the rim of said pulley against the rim of the fast pulley, thereby causing sufficient friction between the pulleys to impart motion to the loose pulley, said motion being requisite to facilitate the shifting of the belt. A completion of the movement of the lever withdraws the pulley from contact with the other pulley, and leaves it at rest. The opposite movement of the lever applies the friction as before, shifts the belt to the loose pulley, and allows it and the belt to come to a rest.

##### Improved Rotary Evaporator.

Adrien Queru, Marlborough, N. Y.—The tubular arms of a revolving carrier support heating pipes, which are arranged parallel with the shaft, so that the water will flow back to the hollow hub. They are arranged also in clusters, by connecting them at each end to a hollow ring. Partitions in the hubs and hollow axle prevent the water of condensation from running back into the lower portions of the hubs; they also separate the steam on entering the pipes. The water will in this arrangement escape directly from the heating pipes by gravity, and thus offer no obstruction to the entrance of the steam; but it will not escape until the pipes rise above the horizontal plane of the axis, so that the partitions will keep it from falling to the bottom of the hubs, and will cause it to flow out at the escape side through the hollow shaft. By the separation of the hub into which the steam enters, the steam is divided and applied equally to all parts of the evaporator. The steam enters at one side, and the water escapes at the other. This apparatus is applicable to use in vacuum pans, both as a heater and agitator.

##### Improved Truss Bridge.

John L. Miner, Brenham, Tex.—The object of this invention is to provide a strong and cheap bridge of improved form. The stringers which are bolted to the pier caps are formed by bolting two parallel beams to each other. They are connected by two sets of zigzag braces, placed the one set at the upper part, and the other set at the lower part, of said stringers, the braces of the two sets crossing each other at their centers. The two stringers are secured to each other by tie rods having a washer and head at one end and a washer and nut at the other end, the said tie rods passing through the space between the two sets of braces. The side walls of the bridge are formed of wall plates, braces, and tie rods. The cap plate is made in three parts, the central part being parallel with the stringers, and at a distance above them of fifteen feet or more. The end parts of the cap plates are inclined, and extend to the ends of and are bolted to the said stringers. The tie rods are vertical, pass through the stringers and through the cap plates, near the upper ends of the braces, and have washers and heads upon their lower ends, and washers and nuts upon their upper ends. The girders are attached to the stringers, and, in connection with the joists, support the planks that form the road bed.

##### Improved Illuminating Roof Plate.

William L. Smith, Jr., P. O. Box 51, Brooklyn, N. Y.—This illuminating tile is made of malleable metal, so as to make it lighter and less liable to break than when made of cast iron. Holes are formed in a metal sheet with collars in it of a size to suit the glass. Another sheet is added, in which holes are made of a size to prevent the glass from falling through, thus forming seats for the glass to rest upon. The holes in the two sheets are punched, so as to correspond with each other in position, and the two sheets are fastened together.

##### Improved Hoe.

William Moore Faunt Le Roy, Fredericksburg, Va.—This invention consists in making the handle adjustable with regard to the blade to suit the various purposes for which hoes of various kinds, as well as shovels, are used.

##### Improved Wagon Jack.

Frank Judson, Des Arc, Ark.—For operating the jack, a lever is raised as far as it will allow, and a catch is placed as far out on the rack of the lever as possible. The lever is then pressed downward to raise the center post. A pin is placed through the lowest visible hole above the upper part of the standard for sustaining the weight thereon, and the operation of raising the center post is then repeated until the wagon or other object to be hoisted is at the required height.

##### Cutting Block Holder for Leather Workers.

Elias P. Newton and Hiram A. Titus, Gloversville, N. Y.—This cutting block holder has adjustable ends provided with pendent extensions and connected by screw rods at top and bottom to provide for longitudinal adjustment.

##### Improved Weighing Scales.

Henry M. Weaver, Mansfield, O.—These weighing scales may be so adjusted that the net weight of any article placed on the platform may be directly read off at the dial plate. By the position of the weight, a portion of the same is thrown above a horizontal line drawn to connect the pivoted points or edges of swinging bars, so that, by rising above the line, it proportionally loses its power as a counter weight, and causes a pointer to describe equal distances, on a dial plate, when equally increased weights are placed upon the platform.

##### Improved Grate.

Jonathan Moore, Jr., Brooklyn, N. Y., assignor to himself and Lorenzo D. Longhi, same place.—The bottom portion of the grate is made in two parts, one being a door to which the other part is a frame. A button on the under side of the frame swings under the door and holds it up. The grate can be opened for cleaning it out without the aid of a lever, the button being readily turned by the fire hook, shovel, or any instrument. The hinges are protected from the ashes and cinders.

##### Improved Horse Detacher.

Anatole Ehret, Telegraph City, Cal.—The traces have loops by which they are hitched to hinged bolts at the ends of the singletrees. A spring catch is thrown by a spring in front of the hinged bolt, to hold the bolt in position for confining the trace. The spring catches are connected with sway bars by chains. When a lever is pushed outward, the effect is to draw back the spring catches, which detaches the traces from the singletrees.

##### Improved Soldering Machine.

William D. Brooks, Baltimore, Md.—This invention relates to that class of soldering machines which inject a flame upon can joints, so as to melt the solder and allow it to be uniformly disseminated along the seam, whether it be in soldering the cap, top, or side seam. The invention consists in providing, on a burner end or gas outlet of the compound blowpipe, a continuous slot or opening, so that all parts of the seam may simultaneously receive the same quantum of heat and its due proportion of solder. A perfect and reliable joint being thus always formed.

##### Improved Gate Hinge.

Stephen G. Peabody, Champaign, Ill., assignor to himself and Lyman D. Chaddon, same place.—This is a hinge for gates, heavy doors, etc., so constructed as to prevent water from entering about the pintle, and also self-closing. Concentric cups are formed upon the adjacent ends of the parts of the hinge. In one cup is placed a coiled spring, which causes the hinge to close itself when released.

##### Improved Apparatus for Making Extracts.

Julius Robert, Gross Selowitz, Austria, assignor to Otto Kratz and R. Sieg, New Orleans, La.—This is an improved arrangement of extractors in a single battery, together with conducting and connecting pipes and heaters, for making extracts of juice from plants, by the process of diffusion, as described in the patent granted to the same inventor, October 30, 1866. The plants are first cut into thin slices and placed in extractors, together with water, and allowed to stand for a short time, when the juice is replaced by other juices of less strength than the remaining juice in the cells of the plants, and so on, until all the juice is extracted. The thick juice is drawn off to the factory, for the subsequent treatment; while the thin juices are passed through the heaters for being warmed, to be used for other diffusions, until made thick enough to be conducted away. By suitable arrangement of pipes and connections, the operation is carried on continuously and in succession in all the different stages without interference of one with another.

##### Improved Guide Wheel for Car Trucks.

Nathan M. Hale, Cleburne, Texas.—This invention consists in supporting horizontal wheels that run under the flanges of a central T rail on springs, the elasticity of which allows the wheels to rise and pass any obstacle without stopping the car or injuring the track. This allows the wheels to be fastened to the cowcatcher, and renders unnecessary the elevation of the main rails to an equality with the central one.

##### Improved Double Cultivator.

James M. Holladay, Twyman's Store, Va.—This invention relates to certain improvements in double cultivators. It consists in the peculiar construction of devices for adjusting the tongue or pole from the rear for the purpose of adapting the implement to hillside cultivation, and also in the peculiar construction and arrangement of the parts of a traction frame, so jointed and attached to the carriage as to admit of the cultivator proper being lifted from the ground and suspended about the axle for the purpose of transportation. It consists, further, in the manner of pivoting the traction frames so as to adjust the cultivator laterally to the irregularities of the row, and to deep or shallow cultivation.

##### Improved Paint Brush.

Etienne X. Thiercelin, Shark River, N. J.—This invention consists of a tapering handle with metallic socket, connected by guide strips or prongs of the same with the top and side part of the outer bristle binding socket, after the handle has been carried centrally through the bristles to strengthen it and make it more durable.

##### Machine for Smoothing and Cornering Panels.

Jacob P. Beck and John H. Weaver, Lock Haven, Pa., assignors of one third their right to A. N. Raub, same place.—This is an improved machine for smoothing and cornering panels, so that the sandpapering of the raised part at one side thereof may be obtained, at the same time with the broad level portion at the other side, by mechanical means in place of by hand work. There are vertically rotating heads, with detachably inserted pads, covered with sand paper for smoothing both sides of the panel, and adjustable detachable bits for cornering the same. The revolving heads work on separate mandrels, one being laterally adjustable to the thickness of the panel, and the other being capable of vertical adjustment on an arc-shaped guide support.

##### Improved Machine for Driving Brush Handles.

John Ames, Jr., Lansingburgh, N. Y.—In this machine devices are provided for driving all the brush handles of the same lot to exactly the same point. The ferrule of the brush is held and supported while the handle is being driven. By means of weighted cords a tube is forced up through the brush head. Within the tube is placed a rod, the upper end of which is pointed so as to open a way for the said tube through the brush head. The rod is supported in the tube by a coiled spring. The tube and rod moves upward through the brush head, and strikes against a stop. This leaves the upper end of the cavity of the tube empty to receive the point of the brush handle, the other end of which rests against the lower end of the driver. The driver is then forced downward by operating a hand wheel, which forces the brush handle through the brush head. As the point of the brush handle passes down through the brush head and through the tube, it is received in the concave upper end of a short tube, through which the other tube passes, and all the parts are carried down together by the continued descent of the handle. By suitable arrangement, when the brush has been removed and another brush head arranged in the thimble, a slight pressure with the operator's foot upon the end of a bent lever will release the tube, and allow it and the pointed rod to be forced up through the brush head by the weights.

##### Improved Knob Spindle Fastener.

Eugene F. Lincoln, Boston, Mass., assignor to himself and John C. Hancock, same place.—This invention consists of a little slide bolt inside of the rose plate, to lock the knob spindle by sliding into a notch in the edge of a disk on the spindle. The said slide has a pawl with a handle pivoted to it, so as to drop into the slot of the escutcheon plate, through which it projects, to lock the bolt when shoved forward. There is also a spring for throwing it back when the pawl is pulled out of the slot to release the slide bolt. The object is to provide a simple inside lock for fastening the door of water and other closets, sleeping rooms, etc., temporarily, without having to change the key from one side of the door to the other.

##### Improved Seedlings Puller.

John S. Swaney, Marengo, Iowa.—As the machine is drawn forward, the jaws are opened to allow the plants to pass between them, and to grasp the said plants and draw their roots from the ground. As the jaws are again opened by the opener, the plants will drop into a concavity formed in the frame, whence they are taken by an attendant and bound. As the plants pass up at the rear side of a wheel, they are struck by a horizontal rod which has a rapid up and down movement. By this device all the soil is knocked off the roots of the plants before they are dropped into the receiver.

##### Improved Machine for Rubbing Oil Cloths.

Charles Rommel and William H. Crane, Elizabeth, N. J., assignors to themselves and Wisner H. Townsend.—This invention consists of a reciprocating rubber, to which simultaneous revolving motion is imparted by its connection with a shaft with cranks arranged in opposite direction. The rubber frame supports the pumicestone blocks on a sliding interior frame, which is hung to a roller with handle, to be readily raised with the pumicestones, for admitting the cloth below the same.

##### Improved Car Axle Box Support.

Charles Billmeyer, York, Pa.—This invention relates to that class of trucks which are intended for narrow gage roads, and which are let down, as respects the axle boxes and the load, so as to prevent the center of gravity, on a tilt, from passing outside the rails and thus overturning the cars.