

pipes, F and J, is forced into the boiler by nipples, as shown at K.

Warsop's aero-steam boiler, shown in Fig. 7, is started by steam in the ordinary manner. A single-acting air pump, worked from the crank shaft, compresses air to a little more than the boiler pressure. The air then passes through a long circuit of straight and coiled pipe, which traverses the exhaust conduit, makes several spiral coils in the chimney, then descends at one side of the fire box, is exposed to the full fire, and finally passes by a valved opening into the boiler at the bottom of the water space. The air escapes into the water through perforations in the pipe.

Fig. 8 represents

OSTLER'S ANEMOMETER,

an instrument intended to measure the force of the wind, and hence one of the most necessary aids to the meteorologist. The device is considered to be one of the most perfect yet invented, as it not only denotes changes in the force and velocity of the wind, but keeps a record of the same. The essential part is a plate, having its face constantly presented to the wind, by a set of vanes, at right angles to it. The force of the wind on the plate causes it to move an arm carrying a pencil, which makes a mark on a sheet of paper especially ruled for the purpose, having separate compartments for registering the force and duration of the wind, and a third to show the amount of rain. The paper is slowly moved by clockwork. The pencil approaches or recedes from the edge of the paper, as the wind varies in force, while a similar pencil attachment, to an arm connected by a spiral worm and nut to the guide vanes above mentioned, registers the direction of the wind in the center compartment. The rain gage is attached to a bent lever, also carrying a pencil, which is drawn toward the center of the paper as the gage becomes filled with water, thus indicating the amount of rain. When the gage is completely full, it tilts, empties itself, and the record commences afresh.

THE AETHRIOSCOPE

is another meteorological instrument, and is designed for measuring the degrees of cold arising from exposure under different conditions of the sky. As represented in Fig. 9, a highly polished metallic cup or concave mirror is placed upon a pedestal, and a differential thermometer is arranged within it, so that one of the bulbs of the thermometer shall be exactly in one focus of the mirror. The other bulb, being not in either focus, is not affected by the pulsations, the effects of which on the cup are concentrated upon the first bulb, the air in which being suddenly contracted upon its exposure to a clear sky, the liquid in that branch of the stem is caused to rise. The cup is kept covered with a metal plate, except at the moments of observation.

Alarming Spread of Trichinosis.

The Transactions of the Indiana State Medical Society, 1875, contain a report on trichinosis, by Dr. George Sutton, of Aurora, Ind., which contains the following alarming observations:

From microscopic examination of pork killed in South-eastern Indiana, we have found from three to sixteen per cent of the hogs affected with trichina, the number of hogs diseased varying greatly in different localities.

"That over five millions of hogs are slaughtered and packed in the Western States, not including those which are put up for family use by the farmers; that if four per cent of this pork is diseased, which we believe to be a low estimate, we have two hundred and twenty-one thousand four hundred and eighty-four diseased hogs put annually upon the market; or, at an average of two hundred pounds to the hog, forty-four millions two hundred and ninety-six thousand eight hundred pounds of diseased meat, every ounce of which, under favorable circumstances, is capable of producing disease.

"That from the cases of trichinosis that came under our observation, and the post mortem examinations, and the effects upon the dog that was fed on the diseased meat, we have come to the conclusion that ninety per cent of disease produced from eating trichinous pork appears either as gastro-enteritis, or as a diarrhoea or dysentery, and not more than ten per cent as the fully developed form of trichinosis, in which the muscular system becomes affected.

"That as diarrhoea, dysentery, and enteritis rank high as causes of mortality in the United States, these diseases causing thirty-one thousand one hundred and fifty-three deaths in 1870, as shown by the last census reports: and as we have seen that a large amount of trichinous pork, capable of producing these diseases, is among the principal articles of food in our country: we think it more than probable that trichinæ have a much greater influence in the etiology of this class of diseases than has been recognized by the profession.

"That it is highly probable that, when the fact becomes more generally known that so large a percentage of pork is swarming with trichinæ, capable of producing disease, it may have an effect upon the use of this meat, and consequently affect the sale, to some extent, of one of the principal articles of commerce in the West."

Messrs. Volney W. Mason & Co., Providence, R. I., have been regular advertisers in the SCIENTIFIC AMERICAN for a number of years. In a business letter from them a few days ago, they make the following unsolicited statement: "Our advertising in the SCIENTIFIC AMERICAN has been most profitable of any, owing to its circulation among the best class of American manufacturers and mechanics, as well as manufacturers in other countries. In a recent trip to Europe, the writer found it was taken regularly and referred to, for improvements and purchasing, by the most extensive manufacturers abroad."

Sight from Science.

Dr. Wm. Hunt, in the Philadelphia Medical Times, says: "A man recently walked into my office with a freedom that suggested nothing about eyes, and said: 'Are you Dr. Hunt? I have never had a good look at you, and wish to see you. I am here on business, and am going away to-night. I owe you much, and will never forget you; but may be you can do something more for me. Do you remember S—, of Illinois, upon whose eyes you operated at Wills Hospital in 1858?' I said, 'Certainly I do.' 'Well,' said he, 'I am the man.' Now, I am not going to relate here an ordinary case of successful cataract operation; but the history is this. S. was the son of a farmer; was fourteen years old when he was brought to Wills. He was practically blind from birth. There is some discrepancy in statement as to the early condition of his eyes; but, at all events, he had no recollection of ever having seen. He was healthy in other respects; had never been to a school for the blind, but was bright, as people usually are who have to feel their way through the world. Dense white capsular cataracts occupied the pupils of both eyes. There was great nystagmus or oscillation of the eyeballs. The boy was etherized, and I performed extraction, making the corneal incisions with a lance-shaped knife, and removing the cataracts with the fine hooks and forceps of the eye case.

The bodies of the lenses, if there had ever been any, were absorbed, as the opaque material seemed to be merely thick membranous substance.

The boy did well, the wounds healing nicely; but when we exposed him to light we found that we had a veritable Casper Hauser to observe! He was a grand confirmation of touch being the master sense, and the only one by which we originally establish our relations with the external world.

He could have given a direct answer to the question of Molyneux to Locke: "Whether a blind man who has learned the difference between a cube and a sphere by the touch can, on being suddenly restored to sight, distinguish between them by the aid of the newly acquired sense only?" Locke answered, theoretically: No! S. answered, practically and decidedly: No! He obtained no knowledge at first, by the eyes, of shapes, distances, sizes, extension, or consistence of objects; of color, of course, he had no idea. Everything, distant or near, appeared to be striking against him, or to be within him. Restrain his arms and hands, and he stumbled about worse, if anything, than before he was operated upon. Encouragement would cause him to move with care, but he was very much afraid. In fact, his sensations were more painful than pleasant, notwithstanding the good promise of the operation. He had to learn as a babe learns, who, in early life, grasps with equal confidence for the moon or its mother's breast. Its early days are occupied with a constant automatic struggle in correcting, by the touch, the deceit of the eye. By-and-by experience settles the question, and it soon gives up its vain endeavors.

The nystagmus in S. continued, and doubtless added to his confusion of vision. In this condition his father took him home. I heard of him now and then as making some good progress, and then lost all knowledge of him. And now, on the 3d day of December, 1874, he walks into my office. His sight is good for all ordinary purposes; the nystagmus is gone, he distinguishes shapes, sizes, distances, and color without difficulty. He told me he was a long time in learning how to see, and at eighteen he went to school and learned to read with ease.

Dear me! when will people be satisfied? I said in the beginning of this note that he wanted me, if possible, to do something more for him. Well, he said he was in winter a herder on the prairie, and he now could not see a horse more than half a mile off, and he would like some far-reaching glasses so as to be able to take in six hundred head of cattle at once!"

Useful Recipes for the Shop, the Household, and the Farm.

In washing calicoes in which the colors are not fast, be careful not to boil them; but wash in the usual way with soap, and rinse in hard water. For dark colored goods, add a little salt to the water; for light, a little vinegar.

In tempering long taps, to keep them straight, take a bucket of clean water and stir it around with a stick or hammer handle until a center is formed; then plunge the tap, already heated, endwise in the center, allowing it to cool before taking it out of the water.

The following is a simple but sure way to tell good from bad eggs: Put them in water enough to cover them. All that lay flat, as they would on a smooth surface out of water, are good. Those of which the big end rises are bad. The vessel used should have a smooth, level bottom.

In cases of a sudden jar, knock, or jam of the hand or fingers, immediately after the blow press the injured part, with the uninjured hand, say between the thumb and forefinger, and gradually let up on it. It will nearly always remove the pain, and generally any swelling, that might occur under the circumstances.

In making whiffletrees, they will be stronger if the front side of the whiffletree is nearest the heart timber and the back side toward the bark; they will retain their shape longer if the timber be split in this direction, across the grain of the wood.

DECISIONS OF THE COURTS.

United States Circuit Court,—Southern District of New York.

PATENT COTTON BALE TIE.—CHAS. G. JOHNSON vs. IRA BEARD. [In equity.—Before Woodruff, Cir. J.—April, 1875.] [This was a suit in equity for an alleged infringement of letters patent of the United States for inventions, granted to Charles G. Johnson as assignee of Charles Swett, May 7, 1872. This patent was a reissue of an earlier patent granted the same patentee October 23, 1866 (antedated April 23, 1866) upon an

application originally filed in the Patent Office in the year 1866. At the time of the reissue the drawing was amended to conform to the model as it then was. The defendant in the suit set up that this change was unwarranted and violated the patent.

A duplicate of the model conforming in all essential particulars to the drawing of the reissue, and certified to by the Commissioner of Patents several months subsequently to the date of the reissue, was put in evidence by the complainant.

After the proofs were closed the defendant moved to open the record for the introduction of testimony to prove the condition of the model at the time when it was filed in the Patent Office, as well as at the time of the grant of the original patent, it being alleged in support of the motion that the defendant had discovered, after the proofs were closed, that the model had been changed after its filing in the Patent Office and that, originally, and even as late as October 23, 1866, it was in the condition shown in the drawing of the original patent.

This motion first came up in an interlocutory proceeding, and, after argument by counsel, was denied upon the ground that the essence of the allegation was fraud in the grant of the reissue, and in a collateral proceeding like a suit for infringement the question of fraud could not be inquired into. When the case came on for final hearing, the motion was renewed. The question having been argued at considerable length, the court took it under advisement and rendered a decision in favor of permitting the introduction of testimony as to the condition of the original model.

The parties thereupon stipulated, for the purposes of the suit, a state of facts regarding the former condition of the model, and the case proceeded to a final hearing.

The conclusions of the court were expressed as follows:

WOODRUFF, Cir. J.: My conclusions in this case are, first, that Charles Swett, the person named in the bill of complaint as assignee of the complainant, and therein alleged to be the inventor of the patent in dispute and improvement for which the letters patent therein mentioned were issued to the complainant, was not the inventor of any tie or mode of fastening cotton bale ties made or used by the defendant herein; nor any tie, buckle, or method of fastening cotton bale ties which is substantially the same in construction, or operating in substantially the same way as the ties made and used by the said defendant.

Second, that neither the original patent issued to the said complainant on the 23d day of October, 1866, upon or for the alleged invention of Charles Swett, in the said bill of complaint mentioned, nor the specification annexed thereto, nor the model of the alleged invention, nor any record of such invention in any manner shows, claims, intimates, or suggests a tie or method of fastening cotton bale ties which is substantially the same in construction or operating in substantially the same way as the tie made or used by the defendant herein.

Third, that the practicability of employing the tie or method of fastening made and used by the defendant was not conceived by the said Swett, nor by the complainant until after the said original patent was issued, and was borrowed from the suggestions of other parties.

Fourth, that if the reissued patent granted to the complainant dated May 7, 1872, and the claims made in the specification annexed thereto, must be construed so as to include (as the patented invention) the tie or method of fastening used by the defendant and called the "Eureka tie," such reissue is invalid.

Fifth, that the defendant has not, by making, selling, and using the said Eureka tie, infringed any right of the complainant, and such making, using, and selling is no infringement of any exclusive privilege legally vested in the complainant, or to which he is in any manner entitled.

The statement of these conclusions is sufficient to enable counsel to prepare a decree in such more technical or specific form, if any, as may be proper.

The state of my health forbids that I should attempt an elaborate discussion of the various points very ably presented by the counsel for the respective parties.

Let the bill of complaint be dismissed with costs.

[Samuel A. Duncan and Geo. Gifford, for complainant.]

[J. H. B. Latrobe and Geo. Harding, for defendant.]

United States Circuit Court—Western District of Pennsylvania.

RIGHTS OF PATENT ASSIGNEES.—HENRY C. MEYER, FREDERIC SMART, AND SAMUEL J. SNIFFEN vs. GEORGE C. BAILLY AND S. A. BAILLY. [In equity.—Before McKenna, Cir. J.—Decided May Term, 1875.]

1. An assignee, under the patent act of 1836, is one who has transferred to him in writing the whole interest of the patent, or an undivided part of such whole interest, in every portion of the United States.

2. A grantee is one who has transferred to him in writing the exclusive right under the patent to make and use, and to grant to others to make and use, the thing patented, within and throughout some specified portion of the United States.

3. If a part of the whole patent has been vested in another, so as to constitute an assignee within the meaning of the statute, an efficacious surrender can be made only by the concurrence of both of the owners of the patent; but this may be manifested by the assignee by his direct cooperation in the surrender, or his subsequent ratification of it.

4. The owner of an exclusive territorial right under a patent may ratify a reissue thereof in which he did not join, by making an assignment under such issue.

5. It is not essential to the validity of a reissued patent that a transferee of an interest in the original patent, who is not an assignee within the meaning of the statute, concur in the surrender.

6. Nor is it necessary to aver in a bill brought under a reissued patent that the grantee of a territorial right acted with the patentee in the surrender of the original patent, or concurred in the reissue thereof.

7. A patentee, assigned the State of Pennsylvania to B., and afterward reissued the patent. Subsequently to the reissue, B. assigned his title to an interest in the State of Pennsylvania, except as to certain counties, under the reissued patent, to the complainants, who, under the title thus acquired, filed a bill in equity against the defendants. Defendants demurred on the ground that B.'s interest was outstanding at the time of the surrender and that he did not appear to have been a party or to have assented to or approved of the surrender, and therefore the reissue was void. Held, that B. was not an assignee within the meaning of the statute, and therefore it was not necessary for him to concur in the surrender in order to give validity to the reissue.

8. The bill sets out complainant's title to the exclusive right, title, and interest under the patent of Pennsylvania, excepting certain counties, and then avers that the defendants "are now constructing, using, and vending" the infringing goods "in the western district of Pennsylvania," concluding the averment as follows: "All of which acts and doings are in violation of the exclusive rights and privileges, so as aforesaid vested in your orators, under and by virtue of the said recited reissued letters patent." Held, that these averments, taken in connection with statements of complainant's title, necessarily import a charge of infringement after the grant to the complainants; and, also, within the territory covered by the grant.

This was a bill in equity to restrain the infringement of letters patent granted to John G. Murdock, on the 26th day of May, 1863, for improvement in hydrants, and reissued May 11, 1869.

Murdock, on the 18th of September, 1867, assigned the full and exclusive right for the State of Pennsylvania, under the original patent, to one Augustus Buerkle. Subsequently, on the 11th day of May, 1869, Murdock surrendered the original patent and received a reissue thereof. On the 27th day of January, 1875, Buerkle assigned the entire title to and interest in the State of Pennsylvania, under the reissued letters patent, excepting certain counties, to the complainants.

George C. Bailly, one of the respondents, demurred to the bill on three grounds, which are fully stated in the opinion.

The case came up on the demurrer, which was overruled by the court, and the defendant was ordered to answer.

[W. Bakewell and T. B. Kerr, for complainants.]

[G. H. Christy, for respondents.]

NEW BOOKS AND PUBLICATIONS.

EXPLORATION OF THE COLORADO RIVER OF THE WEST AND ITS TRIBUTARIES, Explored in 1869, 1870, 1871, 1872, under the Direction of the Smithsonian Institution. Washington, D. C.: Government Printing Office.

This very handsome volume is one of the most important contributions to our national geography which has yet been made. The exploring party, under the direction of Professor J. W. Powell, have done their laborious but interesting work with thoroughness; and the narrative, kept in the form of a diary, is written with care and minuteness, and in a facile and agreeable style. The illustrations are striking, the grandeur of the subjects being almost unparalleled, and are very well executed: the "Bird's Eye View of the Grand Cañon" being a most successful piece of drawing. We should be glad to hear that this book, which has been printed by direction of Congress can be obtained by the public at a moderate price.

A MANUAL OF METALLURGY. By William Henry Greenwood, F.C.S.

Associate of the Royal School of Mines, etc. Volume II. Illustrated by Sixty-seven Engravings. Price \$1.50. New York city: G. P. Putnam's Sons, Fourth avenue and 23d street.

This volume completes a very excellent treatise, on a subject which has not hitherto been dealt with in a popular manner, the first part of which has already been noticed in these columns. We commend the whole manual to scientists, teachers, and students.

LOCKWOOD'S DIRECTORY OF THE PAPER MANUFACTURERS IN THE

United States and Canada, and of Dealers in Paper and Paper Materials, Wholesale Stationers, and Publishers in the Principal Cities, for 1875—1876. Price \$5.00. New York city: Howard Lockwood, Stationers' Exchange, 74 Duane street.

This is a trustworthy and well compiled manual of the personality of the paper trade, and contains some valuable statistical information, obtained by the expenditure of much labor. Mr. Lockwood is also the publisher of the "Paper Trade Journal," issued fortnightly, at \$2.50 per annum, and of the "American Stationer," another semi-monthly publication, price \$2.00, and other trade publications. These and other issues from the same establishment are largely patronized by the trade to whom they are addressed, and have a high reputation for their useful and correct information.

THE SEMI-TROPICAL, a Monthly Journal, devoted to Southern Agriculture, Horticulture, and Immigration. Terms \$3.00 a year Volume I, No. 1. Jacksonville, Fla.: Charles W. Blew.

A creditable commencement of a serial of much local interest, which we trust will obtain a permanent footing among our magazine literature.

**Inventions Patented in England by Americans.**

[Compiled from the Commissioners of Patents' Journal.]  
From July 3 to September 26, 1875, inclusive.

ANCHOR.—J. S. Williams, Riverton, N. J.  
BRAKE, ETC.—J. Y. Smith (Pittsburgh, Pa.), London, England.  
CARPET LOOM, ETC.—E. B. Bigelow, Boston, Mass.  
CINDER SIFTER.—J. Sutton, Islip, N. Y.  
CIRCUIT CLOSER.—D. Rousseau, New York city.  
CLEANING FABRICS, ETC.—G. F. Blake, Boston, Mass.  
CUTTING PAPER, ETC.—A. Campbell, Brooklyn, N. Y.  
CUTTING PAPER, ETC.—S. D. Tucker, New York city.  
CUTTING SCREW TAPS, ETC.—H. E. Boyd, Pittsburgh, Pa.  
ELECTRIC SIGNAL.—D. Rousseau, New York city.  
EXPLOSIVES, ETC.—C. F. W. E. Dittmar, Mass.  
FARE REGISTER.—W. H. Hornum *et al.*, New York city.  
FIRE-LIGHTER.—J. D. Husbands, Jr., St. Louis, Mo.  
FOLDING PAPER, ETC.—C. Chambers, Jr., Philadelphia, Pa.  
HARVESTER PITMAN.—G. W. Harrison, Lansing, Mich.  
HOE.—M. Johnson *et al.*, Lockport, N. Y.  
LIFE-PRESERVING BED.—A. G. Haskell, Mass.  
LIQUID METER.—H. S. Maxim, Brooklyn, N. Y.  
MAKING FELTING, ETC.—L. W. Whipple, New York city.  
MEASURING ROLLS OF CLOTH.—S. C. Talcott, Ashtabula, Ohio.  
OPERATING PROPELLERS, ETC.—G. R. Moore, Westford, Mass.  
PILED FABRIC LOOM.—E. B. Bigelow, Boston, Mass.  
PIPE-BENDING MANDREL.—M. L. Orum, Philadelphia, Pa.  
PNEUMATIC BRAKE.—H. F. Knapp, New York city.  
PRESERVING FRUIT, ETC.—K. H. Loomis (of New York city), London, Eng.  
PROJECTILE.—L. W. Broadwell, Vienna, Austria.  
RAILWAY TICKET, ETC.—J. H. Ross, Buffalo, N. Y. (Two patents.)  
REFRIGERATOR, ETC.—D. McG. Foster (of Brooklyn, N. Y.), Liverpool, Eng.  
ROLLING MILL.—I. Hahn, Pittsburgh, Pa.  
SHEAF-BINDING MACHINE.—W. A. Wood, Hoosick Falls, N. Y.  
SPARK ARRESTER.—W. H. Halsted, Trenton, N. J.

**Recent American and Foreign Patents.****Improved Press.**

Charles S. Swan, Tamaroa, Ill.—In this invention, the follower is arranged in a horizontal case, and worked by the toggle-jointed bars and drums, as in other presses now made. A vertical beater case and beater compress the hay, etc., to a considerable extent before it is acted upon by the press, so as to increase the efficiency of the press; and to raise it, an extension of the shaft by which the drums are worked is arranged above the sweep, with a drum on it carrying a block at the periphery, to which a rope is attached. This block is capable of sliding freely around the drum, being connected to it by lugs or projections, fitted in grooves in it, so arranged as to hold it on, while allowing it to slide freely. This block is held, when the beater is to be raised, by a pawl and catch. The pawl is pivoted to the drum, so as to swing around and allow the block to escape when it is released by the catch, and it is returned to and engaged with the catch by the spring. The catch is raised to release the pawl by pressing under a stationary cam in the crosstree above. The shaft is mounted in a step or socket in the top of the sweep, so that it can be lifted out, and it is provided with a lever to lift it out and let it rest while the drums are kept in motion for working the follower. A yoke holds it out of gear. The lower portion of the beater case is provided with a removable front, and arranged on pivots so as to swing forward when the front is removed, and dump the hay into the horizontal case.

**Improved Tunneling Machine.**

Olney B. Dowd, New York city.—This machine is designed mainly for tunneling under the beds of rivers, where the material is soft and liable to cave and crush in; and the invention consists of a cylindrical case, with a head at the front end, out of which projects at the center a revolving shaft carrying a cutting and scraping arm, which breaks and cuts down the earth, and forces it into the case through an opening at the bottom of the head. The shaft carrying the arm is hollow, and the arm is also hollow and suitably perforated to allow of softening the earth with water, by forcing the water out through the shaft. There is a pipe discharging through the head at the top for watering the earth in that way, to render it sufficiently fluid to be forced out through pipes. In the bottom of the case is an oblique opening, through which a large tube may be projected to sink a hole below the line of the tunnel by working through the tube to sink a boulder or other solid object out of the case. The case is to be forced along as fast as the earth is removed in advance of it, and it is to be followed up by the wall of the tunnel, which is to be built along at the same time as the work progresses, keeping the rear open end packed with the wall of the tunnel, and so as to exclude water and mud or silt from settling into the case. There is a pipe for discharging the silt, etc., by hydraulic pressure.

**Improved Tuning Pin for Pianofortes.**

Julius M. Branig, New York city.—The object of this invention is to enable the tuning pins of a pianoforte or other instrument to be firmly secured in place in such a way that they may be detached and again inserted without loosening them or injuring their screw threads. The invention consists in an open bushing, made of brass or other metal softer than the tuning pins, and a wedge, in combination with the plate and the tuning pins. The holes in the iron plate or frame of the pianoforte are made larger than the pins, and have the bushing inserted in them around the said pins. The bushing is made open at one side, and of such a size that its edges will not quite meet around the pin. A wedge is driven into a notch in the plate at the outer side of the bushing. The wedge forces the middle part of the bushing inward against the pin, so that the bushing may always bear against the pin in at least three points, so as to support it firmly. The soft metal bushing enables the pin to be put in and taken out without injuring its threads, and also beds it firmly in the plate.

**Improved Cotton Planter.**

James B. Onan, Pecan Point, Ark.—The dropping cylinder is formed of two short cylindrical vessels, made open at one end and closed at the other. They are placed upon the shaft with their open ends toward each other, and are connected together so as to be at such a distance apart as to leave sufficient space for the seed to pass out in the desired quantity. To the opener is attached a short chain, which passes back through the furrow directly beneath the discharge opening of the cylinder, so as to spread the seed along the drill as it is discharged from said cylinder.

**Improved Car Coupling.**

Archibald Smith, Omaha, Neb.—The invention consists of a draw-head divided by a central vertical partition into separate cavities, to one of which a wedge-shaped link bar is secured by pivot pin and spring, while to the adjoining cavity with tapering mouth a wedge-shaped and spring-cushioned friction plate is applied. The latter is retained by a lever pin that binds into step-shaped recesses at the back of the friction plate, to hold the same in coupled and uncoupled position. The lever pin is adjusted by a slotted top guide and set screw into fixed position to secure the lever pin and link bar rigidly in position. The entering coupling bar carries the lever pin into vertical position and strikes against the rear part of the friction plate, so as to cause the swinging in and sliding back of the same into the cavity, producing the dropping of the lever pin into the recesses, and the coupling of the link bar by its wedge action and that of the friction plate.

**Improved Sulky Plow.**

Eli W. Russell, Ashley, Mo.—By suitable construction, by pressing the upper end of the lever downward the plow will be swung to the rearward to withdraw it from the ground; and at the same time, and by the same movement, it will be raised from the ground. The upper end of the lever, when lowered, is caught and held by a spring catch, so as to support the plow above the ground for any required length of time, for convenience in passing to and from the field and from place to place.

**Improved Heel Plate.**

George Dunlop, Williamsburgh, N. Y.—This is an improved plate for attachment to the heels of gaiters and other boots and shoes, which shall be so constructed that it may be adjusted or turned, as it wears, to keep the heel straight.

**Improved Oil Stoves.**

Frederick Gates, Frankfort, N. Y.—The case that incloses the lamp and its chimney is made rectangular in form, and is closed by a door made of perforated sheet metal, to allow air to pass through it. To the inner surface of the case is secured a hollow deflector, to deflect the air and cause it to pass down into the lamp, and then up into the cones of the lampburners. A portion of the air passes through the cavity of the deflector and is projected against the lamp chimney. In the top of the case are formed boiler holes to receive the cooking vessels. Between the boiler holes are attached deflectors, which are made V-shaped to divide the current of heated air. Plates attached to the top plate project down a little below air holes, so that the heated air, after passing up to the boiler holes, must descend a little before it can escape through the air holes, so that there will always be a stratum of hot air in the upper part of the case. When the stove is to be used for baking or roasting purposes, a grate is placed upon the top plate of the case, and has provided short feet to raise it a little above the said top plate. In this case the grate is surrounded by a box, the walls of which are made double to prevent the too rapid radiation of heat, and which is provided with suitable devices for maintaining a circulation.

The same inventor has also devised another oil stove, so constructed as to prevent the oil from becoming heated. The upper compartment of the lamp is open at the top, and is partially filled with plaster of Paris, saturated and kept saturated with water to protect the oil chamber from heat. The entire lamp is inclosed with a case, open at both ends, and upon the upper edge of which is placed a plate, in the middle part of which is formed a hole to receive the vessel in which the cooking is to be done. In the lower part of the case is formed a ring of openings to admit air to support combustion. Into the case, just above the top of the lamp, is fitted a hollow ring, which acts as a deflector to cause the air to pass down through the outer part of a plate, while another portion of the air will pass through the holes in a lower plate of the ring, and will be projected against, and will rise around, the chimney, and will thus become heated, and will carry up the heat to assist in the cooking.

**Improved Log Turner.**

Henry Knowlton, Otter Lake, Mich.—This is a device for turning logs upon the sawmill carriage in such a way as to save the carriage from jar. In using the device, a shaft is turned to raise a lever into an erect position, with its straight edge against the flat side of the log. A bar is then drawn over the top of the log, and its hook is driven into said log. The shaft is then turned in the other direction, which draws the lever back, turning the log. The log is then pushed back upon the head block and secured.

**Improved Fireplace Grate.**

John Bawden, Freehold, N. J.—A fireplace basket of the usual shape is cast at its grate-supporting bottom part with a longitudinal connecting bar. The bar is provided with a central semicircular supporting part, that extends toward the rear of the fireplace, for preventing the grate from tilting toward the rear of the fireplace. A front lip of the grate rests on an inside projecting shoulder of the bottom frame, until, by inserting a handle into a perforated lug of the grate, the contact of the lips may be interrupted, and the grate be shaken from one side to the other for dropping the ashes.

**Improved Burial Case.**

David W. Hunt, San Francisco, Cal.—This coffin is furnished upon its bottom with cells for retaining dirt or an equivalent absorbent beneath the body.

**Improved Spring Power Regulator.**

Orrin Collier, Sacramento, Cal.—A brake lever has a forked end for pressing against a band wheel, each side of the face in which is the groove for the band. The lever between its forks contains a spring for bearing with an elastic pressure. The lever has an elbow, which is pivoted to the frame, and an arm extends nearly down to the floor, and terminates in a foot piece, located so that the operator may conveniently rest the foot on it. Under the foot piece a spring is attached to it, and arranged so that by pressing on the floor it lifts the lever and presses the brake on the wheel, and slows the motion or stops it altogether, according to the force with which it is allowed to act.

**Improved Machine for Making Split Keys.**

Willard H. Fox, New Haven, Conn.—This invention comprises pushers and formers, in combination with bending dies of peculiar construction, whereby flat pieces of metal for split keys will be bent double, with the usual ring at the bow, by being pushed through the dies edgewise. The invention also comprises a contrivance whereby a number of pushers and dies, together with cutters for cutting long strips into suitable lengths for the keys, are organized in one machine.

**Process of Coloring Enamelled Photographs.**

William W. Williams, Houston, Tex.—This process of coloring enameled photographs consists in first pasting on a glass plate, coated with dry layers of collodion and another material, a transparent photograph, then backing it with layers of transparent paper, and then laying colors thereon in the usual manner.

**Improved Boot.**

Harry Hall, Pontiac, Mich., assignor to himself and Henry H. Wilson, of same place.—Flat wires made of steel, whalebone, or other suitable material, are inserted beneath supporters, between the rows of stitching and the seam, and are secured, when made of steel, at their upper and lower ends by rivets, the said wires being of such a length as to extend from the top of the boot leg to a little below the top of the counter.

**Improved Glass Monument.**

Anselm Pfeiffer, New York city.—This is an improved monument, which may be ornamented to any desired extent, and which may also be used as a receptacle for flowers, wreaths, and other tokens of remembrance placed upon the grave, to protect them from the weather. It is formed essentially of glass set in a suitable metal, wood, or stone frame work.

**Improved Washing Machine.**

Thomas McGuire Morris, Wabash, Ind., assignor to himself and Freeman Alger, same place.—In this machine, the oscillating rubber will adjust itself to the thickness of the clothes to be operated upon. It may be operated either with or without a cover, and will allow the stationary rubber to be removed for convenience in cleaning the suds box. There is a semicircular bottom for the suds box, formed of detachable blocks with a corrugated rubbing surface.

**Improved Trucks for Moving and Carrying Rails, etc.**

Charles W. Carter, Terre Haute, Ind., assignor to himself and George W. Travis, Cape Girardeau, Mo.—In using the truck, it is backed up to the object to be carried, and a bar is raised until hooks rest against the side of the object, and at the same time a rod is drawn upward, so that the hook may pass over and take hold of the said object. The bar is then lowered, which raises the load above the wheels, and it may then be transferred laterally by drawing the truck.

The same inventor has also patented another truck, for picking up and carrying car axles provided with wheels, railroad rails, bars, shafts, bundles of iron, and other heavy objects. Hooks are caused to drop over the axle, and a handle is lowered, which raises the wheels of the car axle away from the ground, and allows the axle to be conveniently transported wherever desired. In the same way, bent lever jaws are opened and lowered to grasp and pick up a railroad rail or other object to be carried.

**Improved Children's Carriage.**

Henry C. Moody, Oswego, N. Y.—This invention consists in attaching a bent rod to the lower edge of the corner curtains of the carriage. The rod preserves the desired form of the curtains, preventing their edges turning up or wrinkling, and enables them to be neatly and expeditiously folded and secured to the top.

**Improved Refrigerator.**

Henry H. Barnes, Brooklyn, N. Y.—This invention consists of a refrigerator with an ice receptacle and a series of milk and butter coolers, having separately hinged lids, the coolers being so arranged therein that the cold air can circulate around the sides and bottom of the cooling vessels.

**Improved Planking Clamp.**

James Hastings, Elizabethport, N. J.—In using the clamp for planking a vessel, the plank is placed upon the ribs in its proper place. Hooks are then secured to the rib in such a position that the forward end of a screw may rest against the outer side of the plank. The screw is then turned forward to force the plank against the ribs, which brings its outer edge opposite the forward end of another screw. The screw is then turned forward to force the inner edge of the plank close up against the edge of the preceding plank, and the said plank is then spiked to the ribs. When the second screw is operated to force the plank edgewise against the edge of the preceding plank, a grooved bar moves with the plank and slides upon a crosshead, and thus prevents the first screw from being strained or bent.

**Improved Car Coupling.**

Henry C. Hervey and George H. Abrams, Athens, N. Y.—When the cars are run together, the entering link pushes a dog back and passes it, when the said dog instantly drops through the link, and the cars are coupled. With this construction also, when the cars are coupled, the forward edge of the dog rests against a solid shoulder of the bumper head, both above and below the link, so as to have a firm support. In the upper part of the cavity of the bumper head is secured a spring, the forward part of which is slotted to receive the dog, and its forward ends are bent upward, so as to serve as guides to the link in passing to its place in said bumper head.

**Combined Cistern Valve and Overflow Pipe.**

Bernard McGrann and John Solis, New York city.—A socket, which is secured in the bottom of the cistern, serves as a seat for the valve, and has a bar to serve as a guide for the valve stem. The valve stem is made hollow, so as to serve as an overflow pipe to prevent the water from rising any higher in the cistern than the upper end of the said hollow valve stem.

**Improved Chimney Cowl.**

Emanuel Cole, New York city.—This cowl is made of sheet metal, and is secured, by a chimney connecting tube and cap piece, rigidly to the crown of the chimney. A series of vertical partitions run at equal distance from each other in diametrical direction from the end of the chimney tube, and form, with the straight top and bottom plates, a number of channels, that taper toward the communicating apertures around the end of the chimney tube. The wind passes readily along the radiating channels from whatever direction the same may come, and then across the chimney tube to the diametrically opposite channel, which assists, by its widening shape, the passage of the wind, and creates also, by the cross draft, a supplementary draft in the chimney, and thereby the escape of the smoke with the wind. A central diaphragm is attached above the chimney tube to conduct any entering rain sidewise to be collected at the bottom of the chamber, and discharge through an exit spout to the outside.

**Improved Boiler Cleaner.**

Thomas O. Kemp, Beamsville, Canada.—This is a combination, with boiler and superposed reservoir, of pipes provided with stop cocks, one having mouths at the surface of the boiler water, and the other more deeply down into said water. The water level may vary to any ordinary extent and the desired effect still be maintained, namely, a current drawing from the surface of the water.

**Improved Scaffold Clamp.**

William C. Fellows, Toledo, Ohio, assignor to himself and Charles Whittingham, same place.—A roller acts along inclines of a block to clamp the block fast. The roller is applied by means of a bolt which connects the two ends of the yoke. The clamp binds better because of the more free movement of the roller along the block than the sliding bolt; and, by reason of the curves of the block whereon the roller works, the action is more prompt and certain.

**Improved Square.**

William H. Walker, Charleston, S. C.—The wood pieces of the head are connected to the tongue by bolts which move in slots around the axis, whereat an auxiliary head is pivoted to the tongue, and the parts thereof are pivoted together. Braces are pivoted to the auxiliary head, and the wood head is also fastened to them. This arrangement makes a more accurate instrument than when the two parts of the head are pivoted to the tongue separately. The head auxiliary is arranged in the groove of the principal head, into which the braces and the tongue fold.

**Improved Clasp for Ladies' Dress Supporter.**

Egerton A. Bliss, Jersey City, N. J.—The clasp is made of a doubled wire, having arms that proceed from the ring in which the chain is held, are held at their crossing by a band, and then turned inwardly to form reversed hooks, the inwardly bent clamping ends being in the same plane with the shank. The hook is fastened in the lady's belt or girdle, and connected with the clasp by a chain, the dress being lifted from a point below the pendant clasp, and secured therein.

**Improved Paper Bag Holder.**

George H. Cleveland, Camden, Me.—To a plate of heavy brass is attached a pointed rod, of such a length as to be capable of holding a hundred paper bags. A plate of spring brass is swiveled to the upper part of the heavy plate, and is bent twice at an angle, so as to bring its lower end into such a position as to receive a pointed rod. In using the device the lower end of the plate is sprung off the point of the rod, and is turned to one side, so as to leave the rod free. The bags or wrapping paper are then placed upon the rod, a few at a time, until the whole hundred have been placed upon it, by forcing the said rod through the said bags as near their edges as will hold them securely, and so near the edge that each bag may be torn off easily and without injuring the bag for use.