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 Southeastern 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-entiritis, or as a diarrhœa 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 diarrhœa, 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."

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. JOHNSEN *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 bale ties, granted to Charles G. Johnsen 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 1856. 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 vitiated 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 invention 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 operates 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 R. SMART, AND SAMUEL J. SNIFFEN *vs.* GEORGE C. BAILEY AND S. A. BAILEY.

[In equity.—Before McKennan, 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 him 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 reissue.

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. M., the 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 to 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, to the State 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 statement of complainants' 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. Bailey, 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.

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