

## DISCOVERIES AND INVENTIONS ABROAD.

**Oxalic Acid from Saw-dust.**—At a meeting of the Pharmaceutical Society, of Edinburgh, a paper was read by D. M. Thomson, F. R. S., on the manufacture of oxalic acid from saw-dust by Mr. D. Dale. It was discovered more than twenty years ago by Gay-Lussac that several vegetable substances treated with caustic potash yielded oxalic acid, but on account of the high price of potash it could not be thus employed, and the cheaper alkali (soda) was found incapable of producing a like result. It at last occurred to Mr. Dale to try a mixture of soda and potash with saw-dust, and almost unexpectedly he has succeeded in obtaining as much oxalic acid as if he had used potash altogether. He uses two parts of soda and one part of potash, dissolves them in water and produces a solution of 1.35 specific gravity, into which saw-dust is stirred until a thick paste is formed. This paste is then heated on iron plates and is constantly stirred. The mass swells during this operation and inflammable gases having an aromatic odor are given off. The temperature of 400° Fah. is maintained for two hours, and then the mass is completely dried by longer exposure, taking care not to burn it. After this it is reduced to powder, placed on a filter and washed with a solution of the carbonate of soda which seems to have the power of decomposing the oxalate of potash and converting it into the oxalate of soda. To obtain the oxalic acid the oxalate of soda is boiled with milk of lime, when the acid unites with the lime, leaving the soda in solution, and it is concentrated and used over again with the potash. The oxalate of lime thus formed is now placed in leaden vessels, boiled with dilute sulphuric acid, when the sulphate of lime is formed and falls in a precipitate, leaving the oxalic acid in the solution, which is evaporated in another vessel and the oxalic acid obtained in crystals. By this ingenious process two pounds of saw-dust are made to yield one pound of oxalic acid, and about nine tons are manufactured weekly at the works of Roberts, Dale & Co., near Manchester, England. Oxalic acid is employed for removing iron stains from straw hats and linen, and it is one of the best tests for lime in water. This new process has reduced the cost of this acid one-half. In 1851, it was sold for about 32 cents per pound; it now costs sixteen, where it is manufactured.

**Steam Boilers.**—A patent has been taken out by C. W. Williams, of Liverpool (the author of a most able work on the combustion of fuel under boilers) for an improvement in boilers—the object of the improvement being to increase their evaporative powers. It consists in substituting for the ordinary long tubes or flues employed in locomotive, marine and other steam boilers, sets or series of short tubes or flues of a circular, rectangular or other form, at short distances apart, the ends of each set or series being fitted into tube plates or face plates like those into which the long tubes aforesaid are united. The object of this arrangement is to increase the number of tube plates or face plates against which the flame and hot gases generated in the furnace strike. Mr. Williams states that he has found by experiment that a tube plate or face plate surface exposed to the direct action of the flame and hot gases is much more efficient than the interior surface of the tubes themselves in transmitting heat to the water within the boiler.

**Drying Paper.**—A patent has been taken out by T. H. Saunders and J. Millbourn, of Dartford, England, for a mode of drying paper as it comes from the machine and previous to its being introduced to the sizing vat. The usual mode of drying paper as it comes from the machine in a continuous web is to pass it over and in contact with heated cylinders. The paper thus dried is alleged to be inferior in strength to hand-made paper which is "air-dried"—the sheets being hung upon lines and dried in the air. By the new-patented method, the web of paper is made to pass over a series of skeleton drums, and during its passage it is subjected to currents of air which carry off its moisture. Paper that is "engine-sized" may also be treated in the same manner. It is asserted that machine made paper, when dried in this manner, is of as good quality as hand-made paper.

**Composition for removing Boiler Incrustations.**—M. Delrue, of Dunkirk, France, has taken out a patent for a preparation of oak and sumac bark, concentrated

to the strength of 10° Beume, to which is added 30 per cent of cream-of-tartar and turpentine. About three gallons of this composition are added every ten days for every thousand gallons of water in a boiler. It may be better than the numerous other substances which have been and are now used to effect the same objects.

## RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week. The claims may be found in the official list.

**Pump.**—This invention relates to an improvement in that class of pumps which are provided with a tubular piston rod to serve as a water-discharge pipe, and which pumps are submerged and used for domestic or household purposes. The invention consists in the employment of a lever arranged in relation with the check valves of the pump in such a manner that only one of the valves can remain closed at the same time, so that when the pump is stopped after use, the water will be allowed to fall in the piston rod or discharge pipe until it reaches the level of the water in the well, and consequently fresh, cool water obtained at once each time the pump is operated. The invention for this consists in a novel arrangement of the piston and valves whereby a simple and efficient means is obtained for drawing into and forcing the water from the pump chamber into the piston rod and discharge pipe. Nathan Stedman, of Aurora, Ind., is the inventor of this improvement.

**Straw-cutter.**—This invention consists in giving to the bottom of the box of a straw-cutter a rising and falling motion in opposite directions to the motion of the knife by the action of the same lever which imparts motion to the knife in such a manner that the stroke of the knife can be reduced one half of that of knives of ordinary straw-cutters, and still the same effect be produced which ordinary straw-cutters produce by the full stroke; and further, the leverage of the hand lever is increased and the cutting is effected quickly and with less exertion than by the ordinary straw-cutters; it consists further in the arrangement of a lever which has its fulcrum on a pivot secured in the main frame, in combination with the hand lever which is suspended at one end from a link pivoted to the main frame and which is fastened in its middle to the knife head, which is connected to the main frame by a short link, in such a manner that the hand lever, together with the knife head, receives a drawing motion, and the operation of cutting is thereby considerably facilitated. Richard Washburne, of Ramapo, N. Y., is the inventor of this straw-cutter. Address Judge S. Garrison, 22 Court street, Brooklyn, N. Y.

**Direct-action Steam Pump.**—This invention relates to the connection of the water and steam valves so that both shall operate at the same moment to change the direction of the movement of the pistons. Only a single valve is employed on each cylinder, such valve being of the rolling or cock kind; and the invention consists in making the connection of the said valves by means of weighted levers and a tappet arm on the piston rod, whereby a very simple and very effective system of valves and valve gear for direct-action steam pumps is obtained. J. A. Reed, of Jersey City, N. J., is the inventor of this improvement.

**Adjustable Vise.**—The object of this invention is to obtain a vise of simple construction which will be capable of being adjusted and secured in various positions, so that different kinds of work may be held parallel or at an inclination in any direction, as circumstances may require. The invention consists in attaching a vise of any proper or suitable construction to a ball or sphere, which is fitted in a spherical socket formed in a clamp, the parts of which are held in proper position to secure the ball and vise at any desired point by means of a lever and clasp. Norman Allen, of West Meriden, Conn., is the inventor of this vise.

A HINT TO HAY-MAKERS.—"April 7, 1863," is the correct date of the patent granted to L. Rundell, of Coxsackie, N. Y., for the simple and efficient hay-fork that was illustrated and described on page 304, current volume of the SCIENTIFIC AMERICAN.



ISSUED FROM THE UNITED STATES PATENT OFFICE

FOR THE WEEK ENDING APRIL 28, 1863.

Reported Officially for the Scientific American.

\* \* Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

38,271.—Foot Stove.—Sterling Ackley, Hudson, Mich.: I claim a foot-table, d. d. of a foot-warmer or stove constructed substantially in manner as and for the purpose described.

38,272.—Boot.—J. Holmes Agnew, Dobbs Ferry, N. Y.: I claim as an improved article of manufacture a boot having an opening or incision, B, in its instep provided with a lacing, D, or other suitable fastening, and covered by a tongue, C, attached at both ends to the inner side of the boot below the opening or incision; all substantially as set forth.

[This invention consists in making an opening or incision in the top of the instep of the boot, and leaving said opening or incision provided with a lacing, elastic or any suitable fastening by which it may be opened and closed, and also provided with a tongue and arranged in a novel way at the inner side of the boot.]

38,273.—Vise.—Norman Allen, West Meriden, Conn.:

I claim the combination of the vise and universal joint, when the latter is provided with adjustable jaws or a clamp having a clasp and lever or an equivalent fastening applied to it and arranged to operate as and for the purpose specified.

38,274.—Railroad.—Joseph Anthony, Greenbush, N. Y.:

I claim the following devices as described and for the purposes set forth in the above specification:—First, The anchor-sleeper. Second, The elastic cushion having double flanges. Third, The combination of the anchor-sleeper, elastic cushion, the wedge or block, the rail, the sleeper and the gage bar.

38,275.—Grain Drill.—Thomas D. Aylsworth, Pine Bend, Minn.:

I claim, first, The v-shaped drill teeth, H, attached to the rock-shaft, G, by means of the springs, I, in the manner and for the purpose set forth.

Second, The combination of the teeth, H, rock-shaft, G, and lever, K, provided with the pulley, I, as and for the purposes above described.

Third, The combination of the teeth, H, tubes, J, and seed-rollers, D, provided with adjustable cells as above set forth.

Fourth, I claim mounting a seeding machine, provided with the teeth, H, rock-shaft, G, and lever, K, upon rollers, A, A, in the manner and for the purposes above set forth.

38,276.—Sewing Machine.—Cyrus W. Baldwin, Boston, Mass.:

I claim, first, The revolving and reversible hook, K, in combination with the circular head, H, and its accompanying devices for enabling the hook to take and release the loop, constructed and operated substantially as herein described, and for the purposes set forth.

Second, I claim the bobbin or spool-holder, Q, with the spreaders, g, constructed and operated substantially as herein described and for the purposes set forth.

Third, I claim the revolving hook, K, constructed and operated as described in my first claim, in combination with the bobbin or spool-holder and spreaders as described in my second claim, the whole constructed and operating as and for the purposes herein described and set forth.

Fourth, I claim the adjustable cam, g', with the spring, i, the screw, j', the cylinder, b', and the slot, h', in connection with the shaft, c, constructed and operating substantially as herein described for the purposes set forth.

Fifth, I claim the adjustable cam, g', constructed and operating as described in my fourth claim, in combination with the cam or eccentric, c', and also with the spring feeder, e', and rough feeder, f, the whole constructed and operated as herein described and for the purpose herein set forth.

38,277.—Fly Trap.—N. P. Bassett, Fulton, N. Y.:

I claim the cover, B, when provided with an opening, c, surrounded at its lower edge by a flange, d, and used in combination with a tumbler, A, or other similar or suitable vessel, to form an improved fly-trap as herein set forth.

[This invention relates to an improvement on the simple and well known fly trap, hitherto formed of a tumbler or other similar vessel, and a piece of bread placed on its top with a hole in it, and baited with molasses or other suitable substance at its under side.]

38,278.—Sugar Evaporator.—J. A. Bowlus, Fremont, Ohio:

I claim, first, The arrangement of oscillating arms, e, with slats, g, in combination with the shaft, f, toothed segments, b, and racks, i, and with inclined sides, b, of the pan, A, constructed and operating in the manner, and for the purpose substantially as specified.

Second, The arrangement of the side channels, E, in combination with the skimmer, D, and pan, A, as and for the purpose shown and described.

[This invention consists in the arrangement of oscillating slatted arms projecting on opposite sides from a shaft which has its bearings in toothed segments rolling on correspondingly toothed racks in combination with a pan having inclined sides and provided with side channels to receive the scum in such a manner, that by means of the slats on the ends of said oscillatory arms, the scum, which naturally settles down upon the inclined sides as soon as the boiling commences, can be removed and pushed into the side channels through which it is conducted to suitable barrels or vessels, and that one operator is enabled to remove the scum from both sides of the pan without changing his position or walking from one side of the pan to the other.]

38,279.—Revolving Fire-arm.—Christopher C. Brand, Norwich, Conn.:

I claim, first, The combination of a cylinder shorter than the length of the cartridge case used therein, and having when operated a compound back-and-forth and rotary motion, and a lock in such manner that these two move together in a recess or recesses in the stock while the stock remains permanently connected with the barrel of the fire-arm, substantially as herein before set forth.

Second, The combination with a cylinder having a sliding and rotary motion, and lock moving with the cylinder to and from the barrel in a recess in the stock, of a trigger, permanently connected with the stock, the whole being arranged to operate substantially as set forth.

Third, The combination with a sliding revolving cylinder—sliding with the lock in a recess or recesses in the stock—of a lock case of such construction that it performs the functions of guiding the cylinder and protecting the lock, while moving to and from the barrel, substantially as herein set forth.