

the coal continues to lose its properties, and at last ceases altogether to act as a decolorizer, unless it is mixed, after each reburning, with a certain portion of new charcoal.

Another process, and one frequently adopted, is to destroy the organic matters by keeping the charcoal in water and allowing it to ferment for several days, adding fresh water containing about $\frac{1}{4}$ to $\frac{1}{3}$ per cent of hydrochloric acid. The little acetic acid formed, and the hydrochloric acid added, dissolve a small quantity of lime, and so far act beneficially. But the good effect is more than neutralized by the fact of the acids attacking the structure of the bone itself, namely, the phosphate of lime, thus rendering the coal friable, and consequently making much dust and waste.

Having referred to the two methods in common use of revivifying the decolorizing powers of charcoal, and alluded to their inutility and defects, I will describe a new method, as simple as it is ingenious, of rendering old and comparatively useless charcoal as good, and, indeed, better than new. Corenwinder, an eminent German chemist, has, by numerous experiments, established the following axiom, namely:—

“That the decolorizing power of charcoal used in sugar refining is correlative to its power of absorbing lime.”

In other words, the more the pores of the coal become choked up with lime the less is its power of decolorizing. Now, to remove the obnoxious lime without attacking the structure of the bone itself, is a question which has occupied for many years the ingenious mind of my friend, Edward Beanes, C. E., F. C. S.

Mr. Beanes, who, by his chemical researches on the sugar plantations of Cuba, has enabled the planters not only to produce much finer qualities of sugar, but considerably to augment their produce, has recently patented a process of restoring to charcoal its primitive properties of decolorizing sirups. Mr. Beanes found that charcoal, perfectly dry and hot, absorbs dry hydrochloric gas with the greatest avidity and in enormous quantity. The gas combines with the lime and converts it into soluble chloride of calcium. After the charcoal has been treated with gas, a portion of untreated charcoal is mixed up with it; the combined gas remaining in the pores of the former is taken up by the latter, and the whole becomes neutral; the chloride of calcium is then washed out—requiring only a few hours—and the charcoal is afterward burned in the usual way. It is then found that the decolorizing power of the charcoal is augmented at least 100 per cent.

The advantages of Mr. Beanes's process are as follows:—

1st. It removes the whole of the lime and carbonate of lime from the pores without attacking the phosphate.

2d. It augments the decolorizing powers of the coal upward of 100 per cent.

3d. It requires no expensive apparatus, and the process is almost costless, two saleable products being obtained nearly equal in value to the materials employed.

I have thus ventured to introduce Mr. Beanes's process to the notice of English refiners, not simply from feelings of personal friendship, but from the firm conviction that by its general adoption he will confer as great a benefit on his own countrymen as he has already conferred upon the sugar manufacturers of Cuba.—*London Chemical News.*

THE FAIR OF THE AMERICAN INSTITUTE.

The room is now filled with articles on exhibition, and the large attendance promises to make the fair a pecuniary success—a more favorable result than has been realized in many years. We continue our notice of objects of interest.

FRENCH SELF-FASTENING BUTTONS.

This invention is interesting principally on account of the high price for which the patent was sold—\$125,000 in money. The shank is made separate from the button; it consists of a small plate, which comes against the back side of the cloth, and a central stud or hook. The hook is caught into the eye of a stout needle, which is passed through the cloth, dragging the hook after it; an india-rubber

washer is then slipped over the hook, and the button is pressed upon it and given a quarter turn, which fastens it securely. A button is thus put on in an instant without any sewing. The agent of the company is W. B. Watkins, No. 80 Reade street, New York.

COLLECTION OF MINERALS.

Mr. C. Chipman exhibits an interesting collection of minerals, among them two masses of copper ore, weighing, one 300 pounds, and the other 240 pounds. They are mixtures of red oxide and native copper, containing 90 per cent of metal. They are from Del Norte County, California. The vein is from six to eight feet in width, five miles in length, and of unknown depth—one of the most valuable mines in the world. In the collection are the following minerals, all picked up by Mr. Chipman on this island:—

Serpentine, pyroxene, staurotite, graphite, tourmaline, mica, talc, molybdenite, apatite, amianthus, garnet, actinolite, vivianite, lamellar feldspar, apophyllite, rutile, epidote, pyrites, stilbite, quartz, magnetic iron.

TRAVELING INSTRUMENT.

Messrs. Schon & Hull, of Lafayette Ind., exhibit a very novel and ingenious machine for running lines of levels in surveying and making profiles of the ground. Two brass wheels, about $2\frac{1}{2}$ feet in diameter, and following one after the other, support a light carriage which bears a heavy pendulum connected with clock-work. The pendulum maintains its vertical position, and the inclination of the carriage varies the position of a pencil pressing against a slowly revolving cylinder, so as to draw a line corresponding with the profile of the ground passed over; at the same time index hands are turned to give the altitude in feet and fractions. In ascending, the pencil must be carried outward along the cylinder with a rapidity proportioned to the rapidity of the ascent; in descending, it must be drawn in the opposite direction with the same relative motion; while on level ground, it must be held in a constant position. These motions are effected by a very simple device. A horizontal wheel has a vertical wheel pressing upon it and driving it by friction—the position of the vertical wheel depending upon the inclination of the carriage. When the vertical wheel presses upon the center of the horizontal wheel, the latter is not turned in either direction; when the vertical wheel is on one side of the center of the horizontal wheel, the latter is turned in the direction to carry the pencil outward along the cylinder; and when upon the opposite side it is turned in the direction to carry the pencil inward.

This instrument would enable one man to run five to ten miles of levels in a day, instead of the three men usually employed to run from one to three miles, and it is probable that the levels would be sufficiently accurate for preliminary surveys. Of course, no engineer would trust to such a machine in the final location of a line, or in laying rails, though it might answer for taking cross sections and setting slope stakes.

BRICK-MAKING MACHINE.

Messrs. Chambers, Brother & Co., of Philadelphia, exhibit a working model of their novel brick-making machine. It consists of a conoidal iron vessel, with a rotating shaft in its axis, the shaft being furnished with spiral blades, which cut and temper the clay, at the same time forcing it along toward the smaller end of the vessel, where it is finally pressed out through a rectangular opening, in a continuous bar, of the proper size for a brick. This bar is borne along on an endless belt to a revolving wheel, carrying a knife, which cuts the bar into pieces of suitable length for brick.

THE PEOPLE'S CLOTHES WRINGER.

This machine has its rolls constructed from cork; in other respects it is like those usually sold. It is said to be very efficient and durable, being particularly adapted to wringing clothes hot. No. 494 Broadway, New York.

FLASS'S NIGHT-LAMP ATTACHMENT.

This invention consists of a novel appliance for closing the wick of a kerosene lamp so as to diminish the flame. It is stated to be free from the disagreeable odor attending the common method of lowering the flame. No. 110 East 29th street, near Third avenue, New York.

THE "KAPUO KATHAIRIC."

This somewhat ponderous title is affixed to several highly-finished wooden pipes of peculiar shape. It is defined by the inventor as “smoke purifying,” and is intended to deliver smokers from the bad effects of the nicotine in the weed. It is constructed with a cavity at the bottom for the oil and another near the top of the bowl on one side, and still another cavity at the bottom; these are connected by passages which look like the letter N, the cavities being at the angles of the top and bottom. A piece of sponge is placed in the top, and the smoke is purified in passing through it.

LEAD BURNING.

A curious specimen of workmanship is shown by Paul Marcellin of No. 13 High street, Brooklyn; it consists in a peculiar process whereby sheets of lead are joined homogeneously by being burnt to each other—the point of junction being invisible and the surface almost as smooth as the sheet itself. It is very strong, and is much used by chemists and manufacturers.

BOILER-TUBE BRUSHER.

Brushes of wire arranged spirally have been used for some time in cleaning tubes which have become incrustated with soot and ashes. The New England Tube Brush Company exhibit some of these brushes made of flat wire, not round. They are made of spring-tempered steel wire, and act as cutters by reason of the square ends.

TOSHACH'S WINDOW CATCH.

This article is a very efficient one for the purpose. Car windows, as generally furnished with these things, are continually out of order, and can be set at certain points only. This catch allows the window to be set anywhere, and is easy to manufacture. Wm. Toshach, No. 54 William street, New York.

OSCILLATING ENGINES.

Wm. D. Andrews & Bro. make a large display of their peculiar oscillating engines. The cylinders of these engines take steam by vibrating past ports in a fixed chest at the bottom, and they work with great rapidity and ease. They are shown in connection with Andrew's centrifugal pumps, No. 414 Water street, New York.

CANNED FRUIT.

C. C. Williams, of No. 9 Barclay street, exhibits some beautiful specimens of canned fruit in self-sealing jars. Nothing can exceed the clearness of the sirups or the perfection of the colors in the several varieties.

A POCKET LANTERN.

This is a neat little affair, intended to shed light in dark places, and to be always found when wanted; in a word, to be carried in the pocket. It is made of tin, neatly lacquered; it folds up about the size of a small testament, and is a very useful thing to travelers and others. New York Lamp Company, No. 259 Pearl street.

A. & F. BROWN'S ENGINES.

This firm exhibit one of their oscillating engines and steam pumps; the engine is exceedingly neat in design, strong and well proportioned, and receives steam through an ordinary slide valve worked beneath the cylinder. Such an oscillating engine can be easily repaired, if necessary, by any mechanic, and is quite economical of fuel. Any length of stroke can be had, which is not the case with some other kinds. The exhibitors of these engines append a card to them stating that they will be shown in motion when steam is up. From this we infer that steam is not generally “up,” and we have been waiting some time to learn why. The pump shown by Messrs. Brown is highly approved of.

NO STEAM.

We have been waiting some time to see the steam pumps in operation, but have not been gratified. For some reason or other no steam is furnished to one half the machines, and those who go in the morning, as we do, are apt to be disappointed.

This is the second week of the Fair, but yet the concern is not complete or perfect, and engines are being erected and other operations carried on which ought to have been finished before the Fair opened. If the machinery is to be shown in motion, why not put it in motion, and not disappoint hundreds of people who come from a distance?

Improved Grain Separator and Cleaner.

This machine is intended to clean and separate grain at thrashing—by one and the same operation—from smut, chess, cockle, bad grain, seeds, and all other impure stuff, as dust, chaff, sticks, and all kinds of rubbish which destroy its appearance and market value. It delivers the grain direct from the machine to the sack, ready for shipment. The inventor says that this machine is the most effective known; there is no shaking motion about it to impair its durability, but it runs regular and steady.

This machine is also economical for thrashing and cleaning barley; it delivers it separated and clean of beards in the sack ready for market; most other machines deliver barley so bearded that it must be

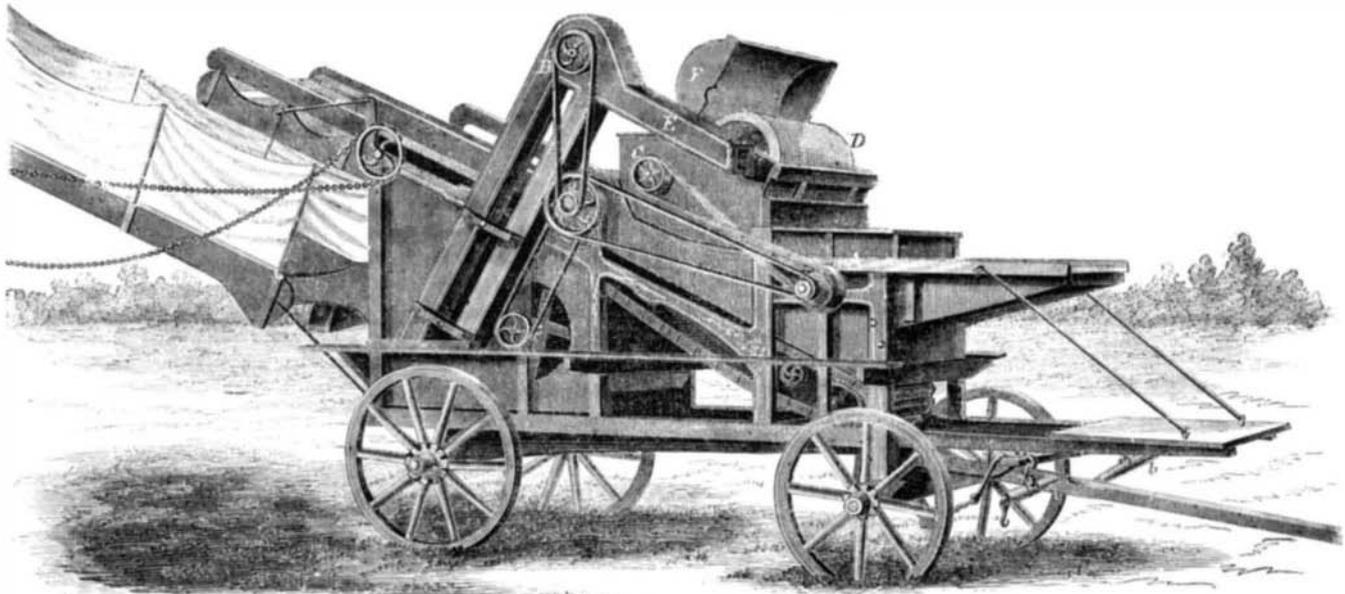
After the grain is thrashed and deprived of its straw and chaff, it runs from the coarse riddle with all the heads, sand, seeds and stuff mixed with the grain, to the elevator at the bottom of the thrasher. The elevator carries it up and empties it in the spout, E; this leads it to the revolving screen, which has two different sizes of mesh—the first one fine, which sifts all the fine particles out through a chute, from which it emerges, finally, into any receptacle. The heavier and coarser particles run further, to the coarser mesh, from whence the good grain subsequently drops into the screw conveyer; still coarser stuff—such as wheat heads, stones, sticks of wood and weeds, drop out at the end of the screen into another chute. A small conveyer, not shown, driven

FARMERS' CLUB.

After its summer recess, the Club, on the 26th of September, resumed its weekly sessions, which are held Tuesday afternoons, at Room 24, Cooper Institute—the meetings opening at half-past one o'clock, P. M., and being free to all who choose to attend. As usual, the faithful President, N. C. Ely, Esq., was in the chair. The SCIENTIFIC AMERICAN not being an agricultural paper, it is our practice to select for publication only such portion of the proceedings of the Club as we suppose will be of general interest to our readers.

PLANT LICE.

Dr. Trimble, in reply to a correspondent, stated

**CLEES'S GRAIN SEPARATOR AND CLEANER.**

tramped with horses or otherwise, and cleaned over with a winnowing mill before it can be sold. It is small, light and requires but little power; it can be built at a comparatively low price; it is not in the way around the thrashing machine, and is easy on the operatives; it sets on the top of the thrasher, out of the way, and is run by a single belt.

The machine has six different outlets—the first for sand and small seeds of all kinds; the second for wheat, grain heads or unthrashed grain and coarser stuff; the third for the clean wheat or grain; the fourth for a second quality of grain, if it should be needed, for seed; the fifth for chess, defective grain, cockle, and other seeds valuable for stock feed; and the sixth for dust, smut, chaff and other light stuff of no value, which is all blown back in the straw. Sprouted grain is taken out separately. The apparatus can be built larger or smaller to suit the thrasher for horse or steam power. It is here represented on a large steam thrasher, the photograph from which this was made being taken in the field where it operated.

This separator is shut up all round; none of the machinery or grain can be seen from the outside. It is thus well protected, and nothing can fall in accidentally to stop or break any part, and the operatives cannot be caught in it; the running parts can be oiled outside while the machine is at work, and any detail can be reached by opening the several doors and hand holes provided—items of great consideration in running machinery.

The arrangement of this separator is as follows:—the thrashing cylinder shaft has two pulleys, A and C, the smaller one driving the beater shaft, and a small pulley on the beater shaft driving the elevator, B, and pulley. The larger pulley on the cylinder shaft drives the fanning-mill pulley, at a high velocity. The fanning-mill shaft has a left-hand screw on it inside the frame, which turns a spur wheel above; the spur-wheel shaft has a bevel wheel at the other end, which drives the revolving screen, D, slowly round. There is also a screw conveyer running at a moderate speed. On the other end of the revolving screen shaft is a pulley which drives a small elevator, to convey all wheat heads dropping out of the revolving screen at the end to the thrashing cylinder; this conveyer is not seen or represented.

by the pulley on the screen shaft, carries these things back to the thrashing cylinder.

The grain which drops into the screw conveyer is carried along in a chute, from whence it falls into a suction blast tube, and finally out of the machine into a hopper; from thence into a sack, ready for market. All particles lighter are lifted up by the power of the suction blast; or, if of such a weight as to be useful, they drop on a sliding board, which is hinged at the upper end, and opened and closed as desired by an iron rod and ring; such grain drops in a middle apartment on the flap which opens after a certain weight is on it and lets the grain run out, or it can be kept separate if desired. Still lighter grain is lifted up and round in the tube and dropped out after a certain weight presses the flap open. This can be kept for stock feed if wanted. Smut, chaff, light stuff and dust are sucked in through a square and serrated opening to the suction mill and blown out over the straw.

The lifting power of the suction blast can be regulated to any degree desired by suitable mechanism. A large door can be seen at F, which opens to the revolving screen, so that it can be taken out to change the wire cloth on it with a finer or coarser mesh in a moment if wanted. There are other hand holes which are opened to do anything inside.

This separator and cleaner can be built on any thrasher now in use, old or new, without adding pulleys and belts, with a small addition of weight and but little more power; for several parts of the thrasher are removed as useless, which this separator takes the place of, so that the additional cost will be small in new machines. It has been used for two seasons with the greatest success, and on thrashers of different patents; it stood the hardest trials in all kinds of grain.

It was patented July 5, 1864, through the Scientific American Patent Agency, by J. N. Clees, of Darbyville, Pickaway County, Ohio. All manufacturers of thrashing machines interested should address the patentee at that place for State rights or other information.

ONE hundred and eighty houses in Paris are engaged in the manufacturing of piano-fortes. They employ over 2,300 workmen.

that each species of plant lice has its peculiar plant on which to live. The species are positively distinguished from each other by the number of lenses in their eyes, which may be counted by the aid of a microscope. Man has no power over these pests, but nature has provided three enemies by which they are held in check; the larvae of certain flies, the warbling birds, which, in their annual migration northward, stop during the prevalence of the aphids, and still more efficient, the lady bugs, which devour the lice in innumerable multitudes. These enemies generally obtain mastery of the aphids in the course of two or three years. At one time our hop growers were nearly discouraged by the destruction of their vines by plant lice, but the pests have now disappeared. The opinion prevails somewhat extensively that the eating of the hop vines by aphids was prevented by sowing buckwheat, but this is a mistake—the result of a mere coincidence; the aphids which live upon buckwheat are a different species from those that devour the hop plant, as the speaker had ascertained by counting the lenses of their eyes.

SIXTEEN HUNDRED DOLLARS AN ACRE FOR CULTIVATED CRANBERRIES.

Dr. Trimble invited the members of the Club present to visit Ocean county, in New Jersey, and see the fields of cultivated cranberries growing there; stating that \$1,600 had been offered this year for the product of a single acre.

THE WAY TO KEEP CIDER.

Solon Robinson, in reply to the question of a correspondent, said that the way to keep cider good, is to get it clean by repeated racking, and fining with isinglass, and then put it up in new, clean, and tight barrels. He had drunk cider put up in this way which was 17 years old, and it was equal to wine; it was the finest cider that he ever saw.

ARSENIC.—Of all metalloids arsenic is most easily isolated by electricity, for it is almost as good a conductor as a metal. By means of an apparatus (known as simple in electro-chemistry), all the metalloids they contain may be very rapidly extracted from arseniferous substances. Place a solution of arsenical matter in a platinum vessel, plunge a zinc wire into the liquid, and the arsenic will appear on the platinum; by prolonging the action the whole of the arsenic is ex-