



Preparing Horn for making Combs.

MESSRS. EDITORS:—You stated recently, in answer to a correspondent, that horns were prepared for making combs by boiling them in water and submitting them to pressure. I will describe another process that is practiced.

The horns are not prepared for pressing out by simply boiling them in water; but they must afterwards be boiled in fish oil. After being thus boiled, the horns—having been previously cut into suitable length and sawed through lengthwise—are spread open under the feet of the workman and inserted between flat surfaces of iron, which are acted upon by powerful screws. The pieces are slightly pressed in this stage, and left to cool, when they are taken from the press, and (not "split in two," only as now and then one is found too thick to press out) the rough parts hewn off. They are again subjected to boiling in oil and afterwards placed between the irons of the press and full power applied. In this way the horn is stretched until it is reduced to the proper thickness, which varies from $\frac{1}{16}$ to $\frac{3}{16}$ or $\frac{4}{16}$ of an inch, according to the kind of comb to be made from the plates. By this operation the horn is rendered nearly transparent.

Knowing that your object is to give reliable information through the columns of the SCIENTIFIC AMERICAN, I have ventured to give the above.

G. L. BAILEY.

Portland, Maine, May 16, 1863.

[We are much obliged to our correspondent for the information which he has furnished. It is the description of a different and apparently improved process from that described by Dr. Ure, who states that the horns of goats and sheep are preferable to others, and, after being soaked for several weeks, they are boiled for half an hour in water, then taken out and sawed lengthwise, then boiled in water again to soften them, after which they are scraped, boiled in water again, and then submitted to a hot press. In France and Holland snuff-boxes are made with the clippings of horn and the shavings of tortoise-shell. The horn-turners soften the horn and shell in boiling water, then submit the mass to pressure in hot iron molds. Grease must not be allowed to touch the mass, or the pieces will not unite together. White horn may be stained red with a solution of aqua-regia; black, with the nitrate of mercury; and yellow, with nitric acid.—Eds.]

Coal-mining in Rhode Island.

MESSRS. EDITORS:—I notice in your issue dated May 16th, a paragraph stating that "coal is now being raised at Portsmouth from the Rhode Island coal-beds," and I have thought that some further information concerning this mine would prove interesting to some of your readers.

This mine was probably the first ever opened in the United States; the first shaft or "incline" being sunk more than fifty years ago. It has been worked more or less since that time; but unprofitably, so far as the owners were concerned, and with indifferent success otherwise, until the year 1858, when the mine, land and privileges were purchased by Messrs. S. L. & G. A. Crocker, of Taunton, Mass., and Capt. Wm. Cobb, of Dighton, Mass., the latter gentleman being appointed agent and treasurer of the company. The mine being full of water at the time of purchase, it was pumped out, and the "incline" was driven down further, so that now it measures 1,300 feet at an angle of about 35° and the coal is re-introduced into the market.

Prof. A. A. Hayes, State assayer of Massachusetts, has analyzed the coal, and says "it is a free-burning red-ash anthracite, without the usual sulphur compounds; being for smelting purposes, almost equal to charcoal." The company have been taking out about sixty tons per day, all of which has found a ready sale for smelting, raising steam, as well as domestic purposes. It is particularly adapted to making malleable iron.

At present the works are stopped a few weeks for

the purpose of placing new machinery into the mine. The old Cornish "plunger pump" is to be removed and its place supplied by three powerful rotary pumps of Fales & Jenks, placed respectively 450, and 700 feet below the surface, and driven by engines placed with the pumps; the steam for which is conveyed in packed pipes and a super-heater placed near the engines. A "best-best" crown-proof endless chain (made for the company in England), worked by a "sprockett" wheel at the surface, will raise and lower the cars upon the inclined track; the "tongue" of the cars being hooked into the links of the chain. B.

Dighton, Mass., May 16, 1863.

[We are glad to receive the above letter from our correspondent, and shall be pleased to receive any particulars which he may have in regard to the mode of raising coal, &c., as we understand that they are somewhat novel.—Eds.]

Induced Magnetism in Tools.

MESSRS. EDITORS:—All tools used in working metals, as those of lathes, planers, shaping and slotting machines, as well as drills, chisels, &c., become decidedly magnetic. This, however, does not exhibit itself uniformly. One of two tools—like in every respect and used of the same metal—will often be a perfect magnet, the cutting point being the north pole and the opposite end the south; while the other exhibits northern polarity at both ends, and apparently to the same degree. The iron shaving cut by a lathe or planer is a perfect magnet—the south pole being the end at which the cutting tool first touches the metal and the north pole that at which it leaves it. Fine cast-iron turnings exhibit the same phenomena. In both these cases the induced magnetism remains for a considerable length of time.

E. J. H. H.

Philadelphia, Pa., May 25, 1863.

[In a former volume of the new series of the SCIENTIFIC AMERICAN, we called attention to induced magnetism in tools, especially the scrapers of mezzotint engravers. Steel and cast iron may be charged with magnetism, by hammering, vibrations, &c., but not soft iron. The fact is known, but the why is not. Magnetism is induced in a body by currents of electricity passing at right angles to it. A current passing on a copper helix surrounding a piece of steel forms a permanent magnet; passing around a bar of soft iron the metal becomes momentarily magnetized—forming an electro-magnet.—Eds.]

A Friendly Response from an Inventor.

MESSRS. MUNN & Co.:—Please accept my thanks for the able and expeditious manner in which you conducted my business with the Patent Office Department as my agents in the matter of preparing specifications, making drawings, forwarding the same and procuring the patent for my water-lute and stench-trap as applied to sewers; also, for the flattering notice, lucid description and elegant engraving of it that appeared in your valuable journal. The thorough manner in which yourself and your able corps of assistants transact your business, and the natural pride you evince in having your services duly appreciated by your clients, has induced me, unsolicited, to address you this note.

T. B. VOORHEES.

New York, May 25, 1863.

A New "War Turtle."

Mr. Boyd Elliott, late editor of the SCIENTIFIC AMERICAN, has invented a plan for a vessel, which he calls a "war turtle." It is claimed for it that, compared with the *Monitors*, it is very simple in its construction, and is estimated not to cost one-half as much; it is built of iron, and intended to carry four guns. Like a turtle, though of the "hard shell class," it is designed to move conveniently in any direction, or to all points of the compass. It furnishes, also, all the advantages of a revolving turret without the expensive machinery now required for it, and is capable of being built more firmly.—*Pittsburgh Chronicle*.

[We do not know about the "turtle" part of the paragraph, but if it is as great a myth as "Mr. Boyd Elliott, late editor of the SCIENTIFIC AMERICAN," we fear it will not accomplish much. No person by that name has ever been an editor on this paper, and we know nothing about him or his "turtle."—Eds.]

VALUABLE RECEIPTS.

PAINTING THE FLOORS OF PIAZZAS.—The floors of piazzas fronting the South and East are liable to leak during severe rain storms. A good cement for the seams of such floors has been a desideratum. An acquaintance of ours who had been much annoyed with the floor of his piazza leaking, was advised to try a cement composed of dissolved india-rubber and asphalt, and he did so, stopping the leakage perfectly. When the cement was sufficiently dry he painted the floor with drab colored oil paint, as a finish to the whole, and completed the operation one evening about sundown. Next morning he went out to examine his piazza, expecting to find the paint partly dry, and the floor improved in appearance. Judge of his surprise when he beheld the black india-rubber cement which he had used floating like bubbles upon his drab paint, and the whole coating of the floor in an undelightful state of spissitude. The oil of the paint had acted upon the cement as a solvent; and the thought which first suggested itself to him was, that although the cement could stop leaks, it was impossible to paint over it. Thinking upon the subject during the day, the idea was presented to his mind that, if he covered the cement with a coat of varnish, he could paint over this when it became dry, and the oil of the paint would not penetrate under it. He acted upon this idea, and has now a most perfect and beautiful rain-tight piazza floor. Others may profit by such experience. Hot pitch is a good water-tight cement for the seams of floors, &c., but it is liable to become soft in hot weather. Linseed oil, boiled with the flowers of sulphur, makes a cement resembling dissolved pitch, and is second to none for stopping leaks in such floors; it is also a great preservative of wood. It is employed for coating the knees of war-ships in the French navy, to prevent dry rot. A cement composed of white lead, oil, and pulverized white sand or glass, is about the best that can be used for such purposes.

CEMENT FOR BRICK WALLS.—A correspondent of one of the Philadelphia papers states that, during a recent north-easterly storm, the rain penetrated through the brick walls of many houses in Philadelphia, and dislodged the inside plastering from them. It is well known that along our Eastern coast the walls of brick houses exposed to storms from the Atlantic will be completely penetrated with water to a depth of two feet, unless they are coated with some water-tight substance. Bricks are very porous and absorb moisture freely, hence brick gable walls exposed to such storms are usually covered with a thick coat of plaster, put on with a brush. One of the best water-tight compositions that can be employed for such walls is a mixture of hydraulic cement and boiled linseed oil. When dry it is perfectly water-proof.

HOW TO MAKE A SILVER TREE.—Mix one part of a saturated solution of nitrate of silver with twenty parts of distilled water, and pour the mixture upon two parts of metallic mercury in a phial. The phial is now to be left standing quietly for several days, when the mixture within will put forth branches, and the figure of a beautiful tree of silver will appear to grow from the mercury.

SILVER SHRUBBERY.—Take a piece of clean copper wire and bend it into the form of a shrub, then lay it upon a plate of glass, over which has been poured some nitrate of silver. In a few hours afterward the copper wire will be covered with brilliant ramifications of silver. A solution of nitrate of silver, poured over a clean plate of copper, also produces a silver formation resembling leaves and branches.

SILVERING SILK.—When a piece of silk is dipped into a solution of the nitrate of silver, and then exposed wet to a current of hydrogen gas, the nitrate is reduced, and the silk is covered with a coating of silver.

A NOVEL mode of lighting has been introduced at a Baptist church, just built at Philadelphia. There is not a gas-burner in the audience-room. In the panels of the ceiling are circles of ground glass, two feet in diameter. Above each of these, in the loft, is an argand burner, and over the burner a powerful reflector. The effect is just about the same as if there were thirty full moons shining in the ceiling. The light is not sharp and intense, but abundant and mellow, and not painful to the eyes.

The Pendulum a Measure of Length.

A pendulum, so adjusted as to vibrate once in every second, must have a certain unalterable length, and this has been so made and used with great success for many important scientific objects. But, though this approaches most nearly to a natural fixed measure of length, it is far from being perfect. In favor of the pendulum may be stated the ease with which the operation of measuring may be performed, the possibility of using it in every part of the globe, and the facility of transporting it from one place to another both by sea and land. On the other hand, it must not be overlooked, that, being made of metal, it is liable to expand by heat and contract by cold; so that if adjusted to the second of time at Greenwich, it could not be relied on if carried to the tropics or the Arctic regions, in both of which cases it would alter in length, in the former becoming longer, in the latter shrinking in size. But the most serious and fatal objection to be urged against the use of the second pendulum as a natural fixed measure of length, is, that the density of the globe is known to vary considerably in various parts. The modern yard measure is based upon the length of a pendulum beating in seconds of mean time in the latitude of London, in a vacuum at the level of the sea, and is in the proportion of 36 inches to 39 inches and $\frac{1393}{1000}$ th parts of an inch.

A Cure for Rheumatism.

The following receipt for the cure of rheumatism was published some time ago in the *Country Gentleman* :—

"Bathe the parts affected with water in which potatoes have been boiled, as hot as can be borne just before going to bed; by the next morning the pain will be much relieved, if not removed. One application of this simple remedy has cured the most obstinate rheumatic pains."

The annexed letter to that periodical appeared in a recent issue, testifying to the utility of the potato water :—

MESSRS. EDITORS:—I take the opportunity of returning my sincere thanks to you in behalf of my "better half," for a very simple receipt, which consisted in the use of potato water for rheumatism. My wife suffered over four years with rheumatism in her shoulders, especially after doing the family washing, until I discovered this simple but most valuable remedy. The first night she used the potato water rather lukewarm, and assured me of its benefits next morning, and that she hardly felt any pain in the shoulders, which encouraged us, and we renewed the application the following night before she retired, using the potato water as hot as she could bear it, and rubbing her shoulders as hard as she could; the effect was that she never, since the last application, now about fourteen months, has had the slightest pain of rheumatism in her shoulders or any other part of her body. Many persons in this country, especially miners, are afflicted with that malady, and I have requested many to try the remedy, but they regard the value of "potato water," in the same light as a great many do the "brandy and salt" cure, viz.: drink the brandy and rub the afflicted parts with the bottle. Then again both these remedies are so cheap that it is thought they cannot be good. JACOB FRITZ.
Fort Walla Walla, W. T.

Spinning Yarn from Cotton Rags.

A letter in the *London Times*, from its Paris correspondent, contains an account of a new machine invented by a French engineer, by which, it is said, "cotton rags of every description may be rendered fit for spinning." With respect to the value of the invention the *Times* says: "It will effect a revolution in industry and increase public wealth to an immense extent. When it is considered how many millions are expended in the purchase of raw cotton, and the short time the manufactured article lasts, every machine that can render worn-out cotton cloth available for spinning, must render great service to the manufacturer." The most that can be said for this invention is that cotton shoddy may be spun with it; but it is of doubtful utility. Cotton becomes weak in the fiber after being woven into cloth and worn for some time. The best use to which cotton rags can be applied is in the manufacture of paper, for they cannot be made into strong cloth.

STREAM ON CANALS.—The experiments with steam navigation on the Erie Canal are said to have proved unsatisfactory. One firm have taken the engines out of their boats and are having the vessels converted into horse-towing boats, and the Rome, Watertown & Ogdensburgh Railroad Company have withdrawn their eight propellers and sold them to the owners of the Delaware & Raritan Canal.

The Habits of a Man of Business.

A sacred regard to the principles of justice forms the basis of every transaction and regulates the conduct of the upright man of business. He is strict in keeping his engagements; does nothing carelessly or in a hurry; employs nobody to do what he can easily do himself; keeps everything in its proper place; leaves nothing undone which ought to be done, and which circumstances permit him to do; keeps his designs and business from the view of others; is prompt and decisive with his customers, and does not overtrade for his capital; prefers short credits to long ones, and cash to credit at all times, either in buying or selling; and small profits, in credit cases, with little risk, to the chance of better gains with more hazard. He is clear and explicit in all his bargains; leaves nothing of consequence to memory which he can and ought to commit to writing; keeps copies of all his important letters which he sends away, and has every letter, invoice, &c., belonging to his business, titled, classed, and put away; never suffers his desk to be confused by many papers lying upon it. Is always at the head of his business, well knowing that, if he leaves it, it will leave him; is constantly examining his books, and sees through all his affairs, as far as care and attention enable him; balances regularly at stated times, and then makes out and transmits all his accounts current to his customers; avoids, as much as possible, all sorts of money matters and law suits where there is the least hazard; keeps a memorandum-book, in which he notes every little particular relative to appointments, addresses, and petty cash matters; is cautious how he becomes security for any person, and is generous only when urged by motives of humanity.

Fish as Food.

There is much nourishment in fish, little less than butcher's meat, weight for weight; and in effect it may be more nourishing, considering how, from its soft fiber, fish is more easily digested. Moreover, there is in fish a substance which does not exist in the flesh of land animals, viz.: iodine—a substance which may have a beneficial effect on the health, and tend to prevent the production of scrofulous and tubercular disease, the latter in the form of pulmonary consumption, one of the most cruel and fatal with which the civilized, the highly-educated and refined are afflicted. Comparative trials prove that, in the majority of fish, the proportion of solid matter—that is, the matter which remains after perfect desiccation, or the expulsion of the aqueous part—is little inferior to the several kinds of butcher's meat, game or poultry. And if we give attention to classes of people classed as to the quality of food they principally subsist on, we find that the ichthyophagus class are especially strong, healthy and prolific. In no class than that of fishers do we see larger families, handsomer women, more robust and active men, or a greater exemption from maladies.

A Great Melting Furnace.

We learn from the *Pittsburgh Dispatch* that a great melting furnace—probably the largest in the world—has lately been completed at the Fort Pitt Works, of Messrs. Knapp, Rudd & Co. It is eight feet in width and thirty-one feet in length—divided into three interior compartments—the "grate bars" seven feet; "pool" six feet, and "kitchen" eighteen feet. The stack rests upon a foundation of thirteen feet square and twelve feet in height, above the surface level. It is twelve feet exterior diameter and nearly sixty feet in height. It was built under the supervision of Mr. Joseph Kaye, the foreman of the foundry. The Fort Pitt foundry is now supplied with six furnaces, of an aggregate capacity of about one hundred and twenty-one tons daily. It is stated that this furnace was first charged on Thursday, the 14th ult., with 38 tons of metal, for the casting of a 15-inch gun. The metal was piled in the furnace, and fire applied between eight and nine o'clock, A. M. Between three and four P. M. the immense mass was completely reduced; the furnace was tapped, and a stream of iron poured into the mold.

DURING the three months ending April 1st, there were exported from Boston 154,904 cases of boots and shoes. This is a large increase over the exports during the same period in 1862—those amounted to but 92,469 cases.

General Steam Cultivation Company.

A large joint-stock company has been formed in London, England, with a large capital, for the purpose of introducing steam plows among the British farmers upon easy conditions. They undertake to furnish any respectable farmer with the apparatus that he prefers on lease, or rather on job—taking from him such a rent, spread over three, five, seven, or ten years, as will repay, in one of these periods, both the interest on, and the cost of the implement. It is in fact, a Farmers' Loan Company, finding machinery required for immediate use, to be paid for in such instalments as will enable the lessee to earn each instalment before he pays it. Deep cultivation is possible on certain soils with horse-power, but every additional horse beyond two abreast is a difficulty and a disadvantage. On the stiffest clay soils, except in very rare seasons, deep cultivation by horse-power is simply impossible. If enough horses can be worked together to pull the implement through, and "smash up" the earth, their trampling does a degree of harm that balances the use of their power. Steam cultivation, and steam alone has solved this difficulty. It ploughs up, and "smashes up" the stiffest clays to the depth of a foot more easily, and more advantageously, than horse-power could work three inches.

A French Weather Prophet.

A correspondence has lately appeared in the Parisian journals, between M. Mathieu de Drome, formerly one of the Legislative Assembly, and M. Le Verrier, the eminent astronomer. M. Mathieu believes that he has discovered a rule for predicting the weather, and bases his theory on meteorological observations taken at Geneva. M. Le Verrier first examines these data, and then laughs at his former colleague. He proves that the tables quoted by M. Mathieu contradict at least as often as they support his theory. M. Verrier observes that the people who profess to predict the weather are of two classes—those who prophecy at fixed days and hours, and those who content themselves with foretelling general phenomena of particular seasons. The first class announce that it will rain, or freeze, or snow, on a certain day. This, if positively done, makes the prophet the lion of the hour. When the time comes round, if he is wrong, he loses his reputation, if his prophecy has not been forgotten; if he is right, he makes a great noise. The more prudent content themselves with prophesying a hot August or a windy March, and secure even betting in their favor. Such persons are like a man playing at dice who bets that he will throw seven against another who says he will throw twelve; the former has six chances in his favor, the latter only one. Weather prophets are only guessers, and of course, they sometimes guess correctly.

How the Guns of the "Keokuk" were raised.

The *Charleston Mercury*, of May 7th, thus describes the process of raising the guns of the *Keokuk* :—

"By order of General Ripley, Colonel Alfred Rhett, on the 17th, after the departure of the iron-clad fleet, examined the wreck, and reported the attainment of the guns practicable. Mr. La Coste, assisted by Adjutant Boyleston, and a detachment of men from Fort Sumter, under different lieutenants, have effected the saving of these fine pieces of ordnance with much trouble. Latterly the *Keokuk* has been entirely submerged, and in rough water. The turret had to be unbolted or unscrewed and taken off before the guns could be slung for removal. This was an unpleasant job of some difficulty, the labor being performed under water, when the sea was smooth, and in the night time only. Those engaged in the undertaking, going in the small boat of the fort, were sometimes protected from the enemy by the presence of our gunboats, at other times not. One gun was raised last week, being removed by the light-house boat. General Ripley himself, night before last, went down to superintend the removal of the second gun."

IN Manchester, N. H., the Amoskeag Company are now using about thirty bales of cotton per week; in full operation they use about four hundred bales. The Stark mills use thirty bales; their maximum is three hundred bales. The cotton mill at Mittineau is running half its machinery full time.

Improved Mill for crushing Cane, Fruit, &c.

Our engraving is a representation of an improved mill for crushing fruits or cane, for the purpose of securing the juice of the same. It consists of a stout wooden framing, A, in which are mounted the crushing rollers, B; part of the framing being removed at the side in order to show their position. These rollers are fitted with two others, C, termed cleaners, whose teeth are of a peculiar shape. These cleaners are actuated by the crushing rollers, and as the latter revolve by power, the cleaners' projections work into them in a similar manner to the teeth of gears. The object of this arrangement is to remove the pomace or other waste from the crushing rolls, as it sometimes collects in large quantities, and very greatly impairs the efficiency of the mill. We think this a decided improvement, and one of general utility in every cider mill. The hopper, D, contains the material to be operated on, and it has a small slide at the bottom to regulate the quantity which passes down to the roll. Below, on the frame, are the tubs and press, worked by the long screw, E, for squeezing the pomace or must, after it has been ground by the crushers. The trough at the end directs the fluid into any receptacle placed at that point. This apparatus is portable.

A patent for the invention was procured through the Scientific American Patent Agency, by J. H. Ellis, of Brooklyn, Pa., on February 4, 1862; further information can be had by addressing the inventor, as above.

AUTO-TYPOGRAPHY.

The above is the name of a new art, described in the London *Photographic News* by its inventor, George Wallis.

It consists in making drawings of subjects with a peculiar hard ink, upon glass, gelatine or paper, and then transferring impressions of those drawings, by pressure, to a metallic plate, from which copies are printed. A peculiar glutinous-colored ink is made, containing some very fine emery; and with this a drawing is executed upon a sheet of transparent gelatine—that being a good material for drawing upon. The ink is laid on the drawing in reverse to the colors of an oil-painting, that is, the higher relief parts are to form the shadows of the printed copy, because these make the deepest impressions on the plate when transferred. After the drawing is executed and the ink has become dry and hard, the sheet of gelatine is placed upon a plate of glass imbedded upon a sheet of india-rubber laid in a recess formed in a steel bed-plate. A plate of smooth Britannia metal is then placed upon the drawing, and the two plates are run between graduated pressure rollers. By this operation an impression of the drawing is made on the plate of Britannia metal, which is afterwards employed in the same manner as engraved steel plates that are employed in bank-note printing. But by the new mode the impression is made direct from the drawing to the plate, while the old mode is simply employed to duplicate costly engravings. Six plates have been obtained from one drawing; but, as these are much softer than steel, a very small number of prints can be taken from them. This invention contains the germs of great usefulness, and it may be developed by further improvements to become an important art.

Collodion for Photography.

The following is the method practiced by M. F. Zuchs of Paris, in manufacturing collodion for photographic purposes:—Into a glass vessel put 20 pounds of common sulphuric acid and 9 pounds of saltpeter reduced to powder and stir the mixture with a glass rod. At the expiration of ten minutes add 1 pound of finely-carded cotton, and allow it to

remain covered with the mixture—stirred occasionally—for about ten minutes, at a summer temperature, then lift and thoroughly wash it in soft water. No traces of acid must be left in it. It is then pressed between the folds of a cotton cloth, so as to remove all the water and leave it slightly moist, when it is placed in a vessel containing alcohol and allowed to remain 24 hours. It is next squeezed to press out

the animal, by throwing the strain on the place where the power is exerted to the best advantage; it can also be accommodated to suit any horse, and does not chafe or wear the skin or cause sores by friction. By referring to our description the reader will readily understand the operation and adjustment of the collar. It consists of the two side-pieces, A, connected at the top and by leather straps, B, and of the hames, C, working in hinged joints, D, secured to the side-pieces. On the upper part of the side-pieces are secured the rings through which the reins pass, and at the bottom those to which the pole straps are fastened. The hames have long curved ends, which pass around to the breast of the horse and are there fastened to each other by a strap. It will be seen that on letting out or taking up the straps at the top or bottom of the collar, as occasion requires, the same may be readily adjusted to any horse; and, also that, each side being independent of the other, it has none of that sliding, oscillating motion so trying to the skin of the beast. All chafing is prevented, says the inventor, by the adoption of this collar—a thing of no small importance to the owners of fine animals. Also, by the position of the hames and their independent motions, which conform to the natural workings of the horse's shoulders, his power is exerted most favorably on the work, and he is consequently less tried and harassed by his duty. The hames also serve, in a measure, to hold the collar in place on the animal's neck and contribute further to reduce the friction on the same. These seem to be desirable features and are accomplished fully by the invention.

The patent for this invention was procured through the Scientific American Patent Agency, on July 17, 1860, by Mr. C. J. Fisher, of Waukou, Iowa, and further information can be had by addressing him at that place.

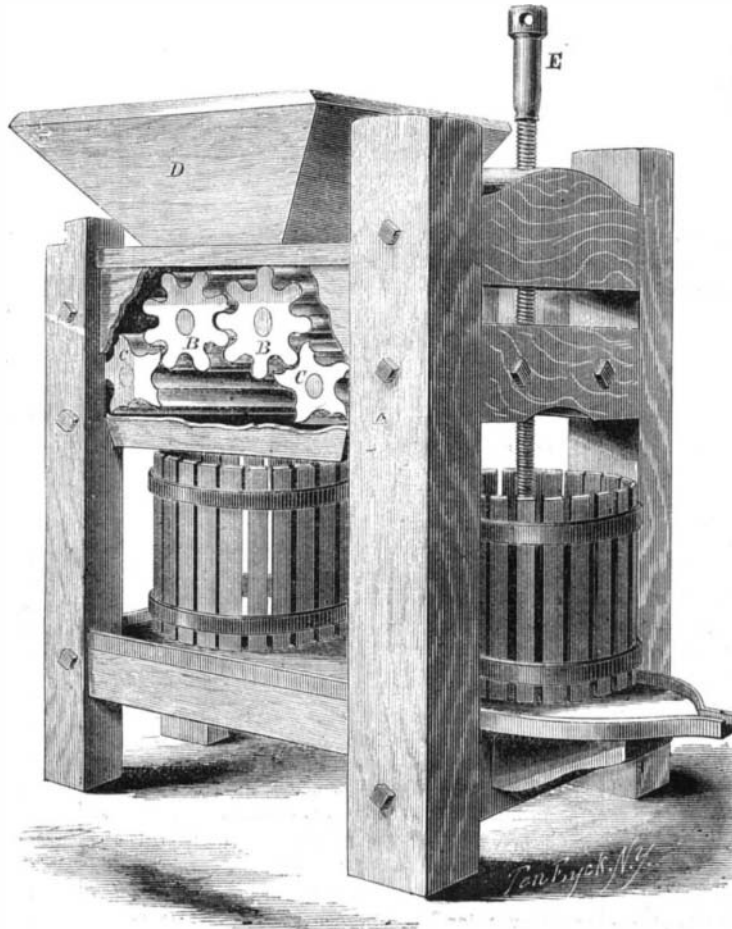
THE VALUE OF SMALL PATENTS.

The value of small inventions is aptly illustrated in the following paragraph. Probably not even the inventor himself realized the value of his idea when he first conceived it:—

"Three million pairs of metal tips are annually applied to the toes of children's shoes. It is claimed that one pair will outwear three pair without tips; this would make an annual saving of nearly six million dollars to those that use them, an important item at the present time. An individual who has three children says that since he commenced buying metal-tipped shoes (one year ago) he has saved the price of new boots for himself."

BEE-ROOT SUGAR IN AUSTRIA.—At the present time there are 126 beet-root sugar manufactories at full work in the Austrian dominions, and eleven more in course of erection, seven of which are in Bohemia and four in Moravia. Of those now at work, sixty are situated in Bohemia, twenty-seven in Moravia, twenty-one in Hungary, ten in Austrian Silesia, five in Austrian proper, and three in Galicia. These 126 establishments last year worked up 13,876,721 centners of beet-root, and paid to their Government 5,246,125 florins for duty. As compared with the previous year, these figures show a falling-off of 319,130 centners of beet-root and 119,874 florins less duty.

At one of the largest tin and copper mines in West Cornwall, England, lately, while nine men and a boy were ascending to the surface in a tram-wagon, the chain broke when they had nearly reached the top, and they were hurled down the incline at an ever-increasing velocity, to the bottom of the shaft, and every one killed on the spot.

**ELLIS'S PATENT CIDER MILL.**

the alcohol then introduced into a mixture of 2 parts alcohol, of 90 degrees strength and 20 parts double rectified ether of the specific gravity 0.730. In this the prepared cotton dissolves and forms an excellent quality of collodion.

FISHER'S PATENT HORSE COLLAR.

The subjoined engraving is a representation of a



new horse collar which contains some desirable features not hitherto observed by us in appurtenances of this kind. It adds materially to the efficiency of