[For the Scientific American.]

Operating the Cutters of Reaping and Mowing Machines.

One of the greatest defects of reaping and mowing machines, practically considered, consists in the present mode of operating the cutters. It being necessary that the cutters should have great speed in order to do good work, it becomes necessary to use, as is the case in most machines, a series of spur or cog gearing. The objections to this mode of operating the sickle are various. One of these, and perhaps the greatest, is the constant liability of the cogs to break, which is a far more serious matter than a person at first might suppose. To illustrate this, let it be supposed that a farmer hires his binders, rakers, &c., and all being ready, the weather fine, all hands go to work, but before the machine has cut a half dozen times across the field, snap goes two or three cogs. Now, to get the machine in working condition again is no easy matter, for perhaps the nearest shop may be two or three miles distant, and hours, under the most favorable circumstances, must elapse before the machine can take its place in the field again; during all which time the hands are comparatively idle, although at the same expense to the farmer as though at work. There is also an objection to gearing on account of the great noise which it makes when driven at the high speed necessary in reaping and mowing machines. To remedy the above objections, I dispense with cog gearing entirely, while at the same time I am able to use a small driving wheel, and yet get the requisite speed. The plan consists in placing on the main shaft, and close to and on each side of the main wheel, a cam wheel. I then attach two treadles, one on each side of the main wheel, to the rear portion of the frame, the front ends of the treadles projecting in front of the main wheel, while friction rolls attached to the treadles near their middle rest on the cam wheels. I now attach a chain or rope to the front end of one of the treadles, pass it down and once around the short crank shaft which operates the cutter bar or sickle, then up and make it fast to the front end of the other treadle. Now, as the machine moves along, a rapid reverse rotary motion will be given to the shaft, and a reciprocating motion to the cutters.

This is undoubtedly the most simple, easiest and least liable to get out of order, where great speed is desired, of any mode now in use. If any one doubts this, a simple experiment will convince them of the fact. To make the treadles work more even and easy, if desired, the chain or rope may be attached to a stiff spring, fastened to the upper side of the treadles. It is not necessary that the chain or strap should be continuous, as the treadles may be attached to different straps or chains, so that as one is wound up the other will be unwound. A clutch may be used on the short shaft to throw the sickle out of work.

INVENTOR.

[The above strikes us as being an excellent improvement. Farmers will be interested in its practical success.—ED. SCI. AM.

Do Alkalies Injure the Teeth?

MESSRS. EDITORS—The item which you publish in the SCIENTIFIC AMERICAN of the 29th ult., in reference to the action of alkalies upon the teeth, and in which you state that "some of the dentists at the late dental convention in Boston asserted that the main cause of defective teeth was the use of saleratus and cream of tartar in the manufacture of bread," conveys a wrong impression of the facts in the case, and as it involves a very important question, deserves to be set aright.

The subject under discussion was "the best means of securing a healthy denture," when a person in the convention, who has, for many years past, been recognized by the dental profession as a monomaniac on alkalies, asked leave to read a paper on topics connected with the question. Liberty being granted, the person produced a long article, cut from some newspaper, and proceeded to read the same. It was not well received by the convention. It was looked upon as discourteous, that a scientific body of men meeting to listen to original thoughts, should have forced upon them an ill-prepared and unscientific newspaper article of two or three columns in length.

The object of the article in question evidently was to bolster up the ancient and exploded theory that alkalies, as used in the process of bread-making, injure the teeth. There was no argument to sustain this position, but simply quotations from the writings of Harriet Beecher Stowe, and others of like *scientific* attainments, tending to show that an excess of alkali in food had in some boarding-houses occasioned disease, not of the teeth, but of the body. The author of the paper had also destroyed teeth by soaking them in a saturated solution of saleratus for fourteen days.

With the reading of the newspaper article, the argument in support of the ruinous effects of alkalies dropped. Some forty members of the convention, many of whom are in possession of an enviable and almost world-wide reputation as scientific men, spoke upon the subject, and not a voice was heard in favor of the alkaline theory. Professor Chapin A. Harris, of the Baltimore Dental College, opposed the theory with much energy, stating that the teeth being made up largely of phosphate of lime, possessed no affinity for alkalies, which could act, even in their most concentrated form, only upon the *cementum* or animal matter of the exposed *bone* of the tooth, leaving the dense covering of enamel very slightly disorganized, except by the action of a positively caustic alkali, and even this acting with feebleness. Dr. Fuller, of Portsmouth, N. H., contended that the human teeth are very rarely if ever exposed to the action of alkalies. The saleratus or soda used in bread is intended to unite with the acetic acid generated by decomposition, or, where cream of tartar is also added, the release of carbonic acid gas, which renders the bread cellular and porous, is effected; in either case the acid is neutralized by the alkali, and a minute quantity of the slightly laxative substance known as Rochelle salt only remains.

Upon one point the intelligent members of the profession seemed united—that *acid*, whether generated by the decomposition of particles of food in contact with the teeth, or taken into the mouth in the form of ascetic acid, as vinegar, malic acid or the juice of apples, citric acid or lemon juice—or whether occasioned by an acidulated condition of the body—in whatever form, acid is the great destroying agent, the great decomposer of the enamel and bony structure; and every year's investigation adds its accumulating evidence in support of a theory which chemistry and intelligent observation have placed upon a reliable foundation. Cleanliness especially, and the use of moderately alkaline washes, when indicated by the proper tests, may be considered as the best means of guarding against decayed (or what is the more correct term, *dissolved*) teeth.

DENTIST.

Saw Gummers.

MESSRS. EDITORS—In your issue of August 8th, Mr. I. S. Westbrook, of Georgia, asks for information as to where the best circular saw gummer can be obtained. We are aware that this is a question frequently asked by owners of circular saw mills, and one, we believe, never satisfactorily answered, until Mr. Dole demonstrated to us that his improvement could be successfully used on the largest class of circular saws. We have purchased one of these gummers, made by Messrs. Dole, Silver & Flech, Salem, Columbiana Co., O.; and we would cheerfully recommend Mr. Westbrook and others, who are similarly situated, to procure one, as we believe them to be admirably adapted for use on circular saws.

E. J. PRUNER & Co.

Tyrone City, Blair Co., Pa., Sept., 1857.

[This invention was illustrated on page 140, last volume, SCIENTIFIC AMERICAN, and we are glad to hear so good a report of the practical success of the machine.—EDS.

Patent Extensions—Mismanagement in the Notices.

Considerable anxiety is just now manifested among many patentees to procure renewals of their patents which are about to expire. This desire is evidenced in the annexed list of petitions now before the Patent Office :—

Improvement in Ship's Blocks.—J. D. Russell & S. Waterman, of New York. This patent was originally granted on the 31st of January, 1844. The case is to be heard on Monday, the 11th of January next.

Type Casting Machine.—David Bruce, Jr., of Brooklyn, L. I. Granted November 6, 1844. The hearing of this case is set down for the 26th of October.

Straw Cutters.—H. M. Smith, of Richmond, Va. This patent was originally issued on the 20th of February, 1844. The day of hearing is set down for the 18th of January next.

Railroad Car Springs.—James Millholland, of Reading, Pa. As this patent expires on September 23, the case is to be heard on the 21st. Doubtless it is a valuable improvement, as otherwise Mr. Millholland would not ask for an extension of the patent.

Carriage Brakes.—David H. Woodward, of Pennsylvania. This patent will expire on the 4th of December. The day of hearing is set down for the 23d of November next.

It should be borne in mind that persons desiring to oppose these extensions are required to file their objections in the Patent Office at least twenty days before the day of hearing.

We have now a "bone to pick" with the late Secretary of the Interior, on the above subject. It will be remembered by many of the readers of the SCIENTIFIC AMERICAN that for some months during the last Administration, notices of petitions for extension were "officially" published in our columns. Soon after the appointment of Judge Mason to the office of Commissioner of Patents, one of the members of our firm, being then in Washington, waited upon the Commissioner, and explained to him the absurdity of publishing such notices in exclusively political journals having a mere local circulation. The justice of our position was at once acknowledged; and, with that desire always shown by Judge Mason to render the Patent Office management unexceptionable in its bearings upon the interests to be affected through its agency, he ordered the notices to be regularly sent for publication in the SCIENTIFIC AMERICAN, where they attracted the attention of parties likely to become interested in opposing such extensions. Not long afterwards there was in process of hatching another scheme, on the part of the Secretary of the Interior, to get a few more of the noble apartments designed to accommodate the future expansion of the Patent Department. We opposed this scheme in round terms, as we felt bound to do by every sense of right; and, as a natural consequence, the "official" list of notices intended for publication in our journal was stopped by the edict of the Secretary.

We cared very little for these notices—in fact, they were something of a burden upon our space; but we thought it would look quite as well for all concerned to consult the proper interests in managing such matters. It is a pity—nay, it is a shame—that the federal government cannot be made to overlook party claims in matters so clearly above and beyond the reach of party influences. The above specified five cases were accidentally discovered in the columns of an obscure print published in this city, otherwise our readers might have waited till August, 1858, for the appearance of the Commissioner's Report, in order to be informed that extensions of such and such patents had been solicited and granted. This dim and tardy system is all wrong, and ought to be remedied.

Apparatus for Navigating the Air.

In rambling through the various avenues of speculative and practical science in search of novelties, we sometimes stumble upon curious customers; and with a desire to strike chords which will send their vibrations into every department where genius finds lodgment, we introduce to our readers, from the London *Engineer*, a description of the ærial chariot of Viscount Carlingford, of Kilkenny, Ireland, whose invention has recently received the Great Seal of the British Patent Office, which, by the way, is as large as a good sized turnip, and is a relic of the barbarous ages :—

"The ærial chariot is made something in the shape of a boat, extremely light, with one wheel in front and two behind, having two wings, slightly concave, fixed to its sides, and sustained by laths, of a half hollow form, pressing against them, and communicating their pressure through the body of the chariot from one wing to the other, and supported by cords, whose force, acting upon two hoops, nearly of an oval shape, hold the wings firmly in their position, using a force that cannot be less than ten tuns, on the principle of corded musical instruments. The ærial chariot is provided with a tail that can be raised or lowered at pleasure, for the purpose of giving an elevating or declining position, and worked by a cord that communicates with the interior of the chariot, which is drawn forward by an ærial screw, of the perfect form of the screw propeller, which screws into the air at an elevation of 45 degrees, similar to the bird's wing, and is turned by means of a winch acting on three multiplying wheels. The wings of the chariot are covered with a network of a lengthened square shape, which produces the effect of bird's feathers when the chariot floats on the air, covered with silk, at which time may be seen its impression with the points forward and the same backwards, by which no pocket, as it were, can be formed by the pressure of the silk on the air. The upper part is finished in the same manner, and both sides of the wings are covered with varnish. The body of the chariot, the wings, and all of it in general, is made of very light wood, with few exceptions, weighing in all from four to six stone, and covering a space from twenty-five to thirty feet square, or according to the weight it is intended to carry. It can also be constructed and considerably increased in size to carry very superior weights, yet the wings will not require to be increased in the same proportion; as, for instance, we see the eagle weighing eighty pounds and upwards while the rook weighs one pound, yet the eagle has only four times the floating surface of the rook. There is also a rudder to the ærial chariot that has something the appearance of a small sail, but, contrary to the rudder; it is worked at its distant extremity by a cord that communicates into the chariot."

We shall be happy to see the Viscount, whenever he may decide to light upon us in his ærial car, and we hope he will not forget to bring along with him a few specimens of the Kilkenny cats.

Drying Sized Paper.

L. C. Stuart has recently taken out an English Patent for an improvement in the above process, which consists in passing the sized paper over and between a series of oblong cylinders, placed one above the other, and having their surfaces perforated with small holes, through which currents of graduated heated air are forced, which escape and come in contact with both sides of the paper after leaving the sizing vat. The series of cylinders and the paper between them are exposed to the open air, so that the vapor may be free to escape, and not run with the paper to be again absorbed by them.

The novelty of this improvement consists solely in the perforated cylinders, as it is common in this country to employ steam-heated rollers for the same purpose.

Artificial Marble.

M. Felix Abate, of Naples, recently communicated to the French Academy of Sciences, a new system of moulding which gives to plaster the hardness and durability of marble. He proposes to employ this substance for all ornamental purposes where marble or stone has been previously used; and from calculations which he has made, he is of opinion that it will cost only one-fifth of the best cut stone.