Canceling Postage Stamps.

Every year, in something over 30,000 offices, the Post Office department cancels a thousand million postal stamps of one sort and another. It was really a little more than this last year—1,049,767,507—but a few thousand more or less make small difference. The thousand million give work enough. One third, the stamped envelopes and the postal cards, cancel themselves, in a sense. No one can use them twice. The stamps nobody has yet been able to cancel fairly and completely, and within the past month the department closed two years of experiment no wiser than it began.

A new ink is generally the stronghold of canceling genius, and to the fat inks—printers' and metallic inks—writing fluid, the three principal acids, caustic potash, and a drug shop of other chemicals have been added by genius at work on a letter stamp. There is a sulphuric acid ink therewhich came from Cincinnati, warranted to cancel a stamp, and which eats a hole through the envelope into the bargain. There is one of caustic potash, backed by a distinguished chemist, which blisters a man's fingers at touch, and has its effects on the glass bottle which holds it. Nitric acid is at the bottom of another ink, and fills the air as it is used with the fumes familiar to laboratories. All these inks do too much. Most of them too little. Your average inventor never tests his invention.

There are other ways to cancel stamps, by genuine *cancellæ*. They have all been invented—a good many separate times. There is one ingenious contrivance which brings a disk down with a half turn at the stamping—a slanting slot does the work—and rips half the features off G. W. or Franklin. Somewhere along the ten-thousandth letter this dulls and takes a blow like a sledge hammer to do its work. The New York Post Office cancels two million of stamps a year, and the New York clerk takes more kindly to the firm, light tap of a wooden stamp. No invention has displaced that any more than the ink.

So the department has given over the attempt to cancel. Gets three cents for a good many stamps, and carries six or nine cents mail matter under the stamp. Is it not a profitable operation? "'Do they have this bother in England?' I asked. 'Oh, no; they black their stamps up so thoroughly.' 'Why can't we?' 'Well, our postmasters are not so careful, and in England they make a row with a man if a stamp is not properly canceled. We can't do that. The department doesn't have enough control, and can't get at a man so sharply.' 'Then this whole loss is simply a question of a civil service, efficient or not?' 'Well, yes; about that.'"—*New York World.*

Spring Ailments.

The remedy for spring diseases, says *Hall's Journal of Health*, by whatever name, is: Eat less. We do not mean that you shall starve yourself, or that you shall deny yourself whatever you like best, for, as a general rule, what you like best is best for you; you need not abandon the use of tea or coffee, or meat, or anything else you like, but simply eat less of them. Eat all you did in winter, if you like, but take less in amount. Do not starve yourself, do not reduce the quantity of food to an amount which would scarcely keep a chicken alive, but make a beginning by not going to the table at all, unless you feel hungry; for if you once get there, you will begin to taste this and that and the other, by virtue of vinegar, or mustard, or syrup, or cake, or something nice; thus a fictitious appetite is waked up, and before you know it you have eaten a hearty meal, to your own surprise, and perhaps that, or something else, of those at table with you.

The second step towards the effectual prevention of all spring diseases, summer complaints, and the like, is: Diminish the amount of food consumed at each meal by one fourth of each article, and to be practical, it is necessary to be specific; if you have taken two cups of coffee, or tea, at a meal, take a cup and a half; if you have taken two biscuits, or slices of bread, take one and a half; if you have taken two spoonsful of rice, or hominy, or cracked wheat, or grits, or farina, take one and a half; if you have taken a certain or uncertain quantity of meat, diminish it by a quarter, and keep on diminishing in proportion as the weather becomes warmer, until you arrive at the points of safety and health, and they are two: 1. Until you have no unpleasant feeling of any kind after your meals. 2. Until you have not eaten so much at one meal, but that, when the next comes, you shall feel decidedly hungry.

Supplies being thus effectually cut off, that is, the cause being first removed, Nature next proceeds to work off the surplus, as the engineer does unwanted steam; and as soon as this surplus is got rid of, we begin to improve; the appetite, the strength, the health return by slow and safe degrees, and we at length declare we are as well as ever.

Hurry and High Pressure.

It is the pace that kills; and of all forms of overwork, that which consists in an excessive burst of effort, straining to the strength, and worrying to the will, hurry of all kinds—for example, that so often needed to catch a train, the effort required to complete a task of head work within a period of time too short for its accomplishment by moderate energy—is injurious. Few suffer from overwork in the aggregate; it is too much work in too little time that causes the breakdown in nineteen cases out of twenty, when collapse occurs. Most sufferers bring the evil on themselves by driving off the day's work until the space allotted for its performance is past, or much reduced. Method in work is the great need of the day. If some portion of each division of time was devoted to the apportioning of hours and energy, there would be less confusion, far less hurry, and the need of working at high pressure would be greatly reduced, if not wholly obviated. A great deal has been written and said of late, to exceedingly little practical purpose, on the subject of "overwork." We doubt whether what is included under this description might not generally be more appropriately defined as work done in a hurry, because the time legitimately appropriated to its accomplishment has been wasted or misapplied. Hurry to catch a train generally implies starting too late. High pressure is, says the *Lancet*, either the consequence of a like error at the outset of a task, or the penalty of attempting to compensate by intense effort for inadequate opportunity. If brain is bartered for business in this fashion, the goose is killed for the sake of the golden eggs, and greed works its own discomfiture.

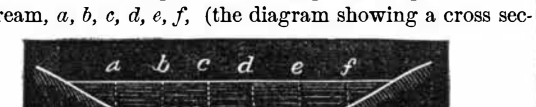
Stream Power and its Utilization.

Almost every man has about him in his daily walk sufficient apparatus for a tolerably accurate estimate of the quantity of water flowing in any stream. A walking stick, a jack-knife, and a watch, provided the walking stick is just three feet long, are all the tools necessary for the purpose. With these simple appliances, says *The Millstone*, the power may be measured in the following manner:

Take a section of the stream as uniform in breadth and depth as possible, and measure off upon its bank some definite length, say from one to four hundred feet, according to the rapidity of the water; set a stake close to the water at each end of this section, then throw into the water, opposite the upper stake, a green twig or limb of a tree or other object of such specific gravity as to nearly but not quite sink, and of such size that one portion shall remain at the surface while another portion nearly touches bottom, the object being to get the average speed of the water. The resistance caused by the bed and banks of the stream necessitate some care in this part of the experiment.

Note accurately the time the object is passing from stake to stake, and repeat the operation several times and at as many points towards the opposite shore; the sum of the several times divided by the number of points at which the speed was taken gives the average speed of the water.

Now measure the depth at several equidistant points across the stream, *a, b, c, d, e, f,* (the diagram showing a cross section of the stream).



The sum of these depths divided by the number of points at which the depth was measured gives the average depth; this average depth multiplied by the breadth of the stream gives the area of the cross sections; this area, multiplied by the length of the section, gives the cubic contents of body of the water embraced in the section. Thus we have the quantity and its velocity, which are elements necessary to show the value of a stream for manufacturing purposes, provided it has sufficient fall anywhere to render it available.

Allowing 62 lbs. for each cubic foot of water, and a supply of 1,000 cubic feet per minute, and a fall of 10 feet, we have 1,000 multiplied by 62, equals 62,000 lbs.; 62,000 multiplied by 10 equals 620,000 lbs. momentum; 620,000 divided by 33,000 equals 18·7 horse power. One fifth at least must be deducted for friction and loss, making in this case about 15 horse power.

Velocity of Electricity.

Dr. Sabine has devised a method of measuring the contour of electric waves passing through telegraph lines. It is probable that in this sense alone electricity may be said to have a velocity. The early experiments on the time elapsing, between starting electricity into one end of a conductor and receiving it at the other end, gave totally contradictory results. This interval would depend on the electromotive force employed, the resistance and capacity of the conductor, and the sensitiveness of the receiving instrument. It would therefore by no means be proportionate to the length. By the following method the electrical condition of any point of the line may be examined quantitatively at intervals of 0·001 of a second or less after starting the electric impulse. It thus becomes possible to measure the form and speed of a wave. Suppose one end, A, of a conductor, A B, is placed to earth, and that the other, B, is connected with one pole of a battery whose second pole is put to earth. Then any point of the conductor, as C, will assume a potential which will be proportional to the resistance of A C. This potential may be measured by connecting C for an instant with a condenser or accumulator, and then discharging the latter through a delicate galvanometer. When the circuit is first closed, a minute interval of time is required before C will attain its full potential measurements made of the relation of these quantities, showing the form of the electric wave passing the point, C. The only mechanical difficulty is to construct a chronograph which will allow C to be connected with the condenser, a small but accurately determined time after A is connected with the battery. A heavy wheel of brass is set in motion by a steel spring so that it shall revolve exactly twice a second. The interval through which the spring acts being always the same, a nearly constant velocity is always imparted. The disk is divided into 500 equal parts. A movable index serves to regulate the angle through which the disk turns between the two connections to be recorded. The time of revolution of the disk was first determined by noting the figures read in succession under the film of a small telescope, when the disk was illuminated by half-second flashes of an induction coil. The force of the spring and the position of the trigger releasing it were adjusted until the right velocity was obtained. Recently a condenser was discharged through a known resistance for some interval indicated by the disk, and the time calculated, according to the leakage formula, from the initial and final readings of the galvanometer. If the two do not agree, the spring is altered until they do; but its action is found to be very constant and not to need alteration, except after taking the apparatus to pieces for alteration. Several series of experiments are given, and the results show the delicacy and accuracy of the method. —*Philosophical Magazine.*

NEW BOOKS AND PUBLICATIONS.

ELEMENTS OF GEOMETRY. By G. M. Searle, C.S.P. Price $1.50. New York city: John Wiley and Sons, Publishers, 15 Astor Place.

The author's principal object in the preparation of this work has been the desire to reduce what is supposed to be self-evident to the smallest possible amount, and thus to make the science more strictly logical. There are several peculiarities about the treatise, notably the avoidance of definitions until the thing to be defined has been shown to be possible, the omission of the theory of proportions and substitution of the equality of fractions therefor, besides various other minor points, which tend to render the work conformable to the author's general plan. The volume as a result is rendered much smaller than the ordinary school geometry, and therefore, while giving the student a more logical and connected view of the science, will, it is believed, enable him to master the same in shorter time.

STRENGTH AND DETERMINATION OF THE DIMENSIONS OF STRUCTURES OF IRON AND STEEL. By Dr. P. J. J. Weyrauch. Translated by A. Jay Du Bois, Ph.D. Price $2. New York city: John Wiley and Sons, Publishers, 15 Astor Place.

"More attention to just such facts as are here set forth and worked into a general method of dimensioning—facts which have long been at disposal, but never before properly set forth in a shape to meet the daily wants of the practising engineer and constructor—would make such sad disasters as that at Ashtabula impossible" (Translator's preface). True, so far as the facts are concerned, but not so as regards this book. When authors attain that happy facility of producing works with say seventy-five per cent less formulas and heavy mathematics, then (and not until then) will their books "meet the daily wants of the practising engineer." If all practising engineers were scientists of the rank of Dr. Du Bois or Dr. Weyrauch, we do not doubt but that this book would be just the thing needed. But we venture to assert that not one practising engineer in fifty would take the time to stop in the middle of his work and pore over this volume to find out what the formulas mean and how they are to be applied. Literature for the study may be as theoretical and as abstruse as the authors choose to make it; but where it is meant for practical purposes, it cannot be too clear and simple. For an illustration of our meaning, we refer to the pages of this journal, where many a subject, which has appeared elsewhere buried in calculus and the Greek alphabet, is elucidated in plain English and by simple computation. Professor Thurston adds an appendix on his strain diagrams, all of which is old and has been repeatedly published in substance elsewhere.

Inventions Patented in England by Americans.

From March 9 to March 22, 1877, inclusive.

ANIMAL PULP.—L. Coburn, Worcester, Mass.
BOILER FURNACE, ETC.—B. Hershey, Erie, Pa.
CANCELLING STAMPS, ETC.—W. Morris, Richmond, Va.
ELECTROPLATING WIRE.—W. Wallace, Ansonia, Conn.
FISH PLATE, ETC.—J. Eno, Council Bluffs, Iowa.
GAS RETORT PROCESS.—W. Karr, Frostburgh, Md.
HORSESHOE BARS.—W. M. Greenwood *et al.*, Cincinnati, Ohio.
LATHE.—W. S. Cooper, Philadelphia, Pa.
LIME KILN FLUE, ETC.—W. S. Sampson, New York city.
MAKING ICE, ETC.—E. A. Gillet, New York city.
MAKING STEEL.—S. Barker, Knoxville, Tenn.
RIBBON HOLDER, ETC.—H. V. Dempster, Washington, D. C.
RULING MACHINE.—W. O. Hickok, Harrisburgh, Pa.
SACK-SEWING MACHINE, ETC.—W. Webster, San Francisco, Cal.
SMELTING FURNACE, ETC.—G. M. Moller *et al.*, Plainfield, N. J.
STOP VALVE.—E. Russell, New York city.
TRAMWAY CAR.—J. Stephenson, New York city.
WASHER, GASKET, ETC.—Vulcanized Fibre Company, Wilmington, Del.

Recent American and Foreign Patents.

NEW MISCELLANEOUS INVENTIONS.

IMPROVED METHOD OF ATTACHING KNOBS TO SPINDLES.

William De Courcy May, Baltimore, Md.—The object of this invention is to provide a means for preventing the loosening and loss of the screw that fastens the knob of a door to its shaft. The improvements relate to the use of a band, ring, or sleeve, made to encompass the socket portion of the knobs so as to cover the screw, and consist, first, in constructing such band, or sleeve, with a transverse slit to permit the same to be opened and be sprung laterally upon the socket or shank of the knob; and, secondly, in constructing such band, or sleeve, with one or more tongues which enter the nick of the screw and prevent it from turning.

IMPROVED SADDLE.

Henry Ruwart, Jefferson City, Mo.—This invention embodies certain improvements in saddletrees designed to render the saddle convertible at will into either a gentleman's saddle, a lady's saddle, or a "muly" or harness saddle. The improvement consists in constructing the tree at its front end, opposite the cantle, with a key and a locking bolt, and the pommel, horns, or cap with a bottom plate provided with a slot corresponding to the key, and a perforation or recess for the locking bolt; so that when the pommel, or its equivalent, is placed upon the tree and turned around to a given position it is securely attached to the saddletree.

IMPROVED THILL COUPLING.

John L. Crist, William E. Crist, and George H. Smith, Sacramento, Cal. —This coupling, for thills or shafts of vehicles, consists of a spring for connecting each of the shafts with a clamp or clip attached to the axle, and upon the lower end of the said spring a nib is formed that engages with the clip when the end of the spring is clamped by a set screw in the clip. The spring is sufficiently rigid to support the thills, while it is also sufficiently flexible to permit of the required latitude of motion. All rattling and noise are obviated by the improvement, and the thills are readily attached and removed. To afford additional security, a ring may be added for receiving a strap that is attached to the thills.

NEW MECHANICAL AND ENGINEERING INVENTIONS.

IMPROVED AUTOMATIC WAGON BRAKE.

Charles T. Warren, Atlanta, Ga.—This improved brake for vehicles is so constructed that it will be applied to the wheels by the operation of holding back, and at the same time will allow the vehicle to be backed without its being thrown into action. The construction is simple and ingenious, rendering the device excellently adapted to its purpose.