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GREAT IMPROVEMENT IN FEEDING ARMIES.

On the 30th of July, 1850, Gail Borden, Jr., then residing in Galveston, Texas, now of Elizabethport, N. J., obtained a patent for concentrating animal food by which it was rendered far more portable, and could be kept sweet and fresh for a long period. After securing patents for his improvement in foreign countries, Mr. Borden bought droves of cattle in Texas, and prepared large quantities of food by his process. But he neglected to have his new article tried and advertised so as to create a demand as rapidly as it was produced, and he consequently found a large supply on his hands for which there was no market. Though the numerous shipmasters and others who tried it recommended it in the highest terms, the enterprise of manufacturing it did not succeed. It led Mr. Borden, however, to the invention of his plan for condensing milk, out of which he is making money fast enough. We record this fact with great satisfaction, as Mr. Borden is the most loyal of men.

We have just received a pamphlet from Professor E. N. Horsford, late of Harvard University, in which Mr. Borden's scheme of concentrating animal food is urged upon the Government as the proper plan for preparing fresh meat for our armies. Prof. Horsford discusses the subject with all the lights of statistical returns, and with those of the most profound physical, chemical, and microscopic science. He shows that an ox weighing 1,800 lbs. on the hoof yields only 112 lbs. of dry food, and that by the actual methods practiced in the army only 18 lbs. is utilized!

Prof. Horsford's plan is to make the fresh meat for the armies into sausages. He would have a large establishment erected by the Government in Illinois, and have it furnished with all suitable vessels and conveniences for conducting the operations. He estimates that this plan would effect a saving in feeding our armies of more than \$100,000,000 a-year, besides supplying the soldiers with more healthful and palatable food, and increasing very largely that all-important element, the mobility of the troops.

We have been frequently impressed during the progress of the war with the efficiency of the Commissary Department of the army. It has been uniformly praised in the reports of commanding generals, and we have never seen a word of complaint against it in the letters of newspaper correspondents, of subordinate officers, or of private soldiers. To the able and intelligent officers of this department we commend Prof. Horsford's suggestions as worthy of the most careful consideration.

In England bean meal is extensively used for fattening hogs.

A PLEA FOR INVENTORS.

Many good machines and useful inventions are condemned prematurely and thrown out of use for want of a little practical common sense on the part of those who operate them, and we regret that even in this day of machinery, when its use is all but universal, there are many narrow-minded and conservative individuals who are so wedded to old ideas and old-fashioned ways of doing work, that they see no good in any thing that tends to save it, and every improvement is, in their eyes, a "new-fangled humbug." It is surprising to see the extent to which this indifference, or worse than indifference, is carried, and it is but simple justice to inventors that their efforts to benefit society should meet with more encouragement from it.

One patient, earnest and energetic inventor of a capital washing machine, said to us recently: "The greatest difficulty I have to contend with is the prejudices of servant girls; they throw up their hands in horror when the machine comes home, and give such doleful accounts to their masters and mistresses of the machine's inefficiency, that I experience serious loss in consequence."

This is precisely the same trouble that many others have to encounter, and we feel it to be so unjust to inventors that we herewith remonstrate against it. Servants are not alone to blame, either; very many others who should be more thoughtful look upon a new invention as something that will take care of itself, that requires no judgment or practice to become acquainted with its virtues, and if they "don't get the hang of it," so to speak, at the first trial, they not only throw it aside themselves, but condemn it as useless to their circle of acquaintance.

Now this is all wrong. An individual has no more moral right to slander a new invention than he has the character of respectable people, and the gross injustice of it will be apparent to all thoughtful persons. A lady said to us the other day, "I don't like Wheeler & Wilson's machine;" and when we inquired the reason, she replied, "Oh, the threads break sometimes." Poor woman! What a distressing hardship! Another complains of clothes-wringers, and don't like them because it is too much trouble to fasten them on the tub, &c. Now, these all seem very trivial matters in themselves, but it is not the simple refusal of these benighted individuals to employ the results of ingenuity, but the bad influence they exercise on the community that we deplore.

This article is not a plea for useless machines, or for any special machine, but it only asks that common justice be shown to new inventions. Try them as if you wanted to get the benefit of them, reader! and not as if you expected to see them get up and walk and talk. Put them upon their merits alone, and if you are satisfied that you have done all that you would if the machine were your own, and still fail, ask some of your acquaintances to help you out of your trouble, and you will doubtless be successful. A little oil goes a great way sometimes, and a screw loose, or a pin out of some part, makes an important difference in the action of a machine. Always be sure you are right, and then go ahead; and if you use as much common sense in trying a new invention as you do in the ordinary affairs of life, you will not be disappointed.

HAP-HAZARD.

When a man does work at hap-hazard he generally repents of it. Taking a size on a rule at random has spoiled many a fine piece of work, and giving the handle of a slide-rest on a lathe or planer a turn too much, has been the means of throwing heavy shafting out of the center, smashing the shears, the slide rest itself, and very often the face plate of the lathe. The skillful artisan shows his superiority in dealing gently and cautiously with his work, and it is only the tyro that jumps to conclusions, and guesses where he ought to be positive. All men are liable to accident and mischance, none more so than mechanics, upon whom depends a great deal at the present time, but skill is needed, not sleight of hand, and sober progress instead of the haste that makes waste. No come-by-chance job can be a good one, and there is no place where cool heads are more required than in the workshop. Manual dexterity is a good thing, but that does not mean tricks, legerdemain or capers of

any sort. It is far better to take a reasonable time and do the job in hand well, than to rattle it off "any how," and have it to do over again."

THE CHENANGO BOILER EXPLOSION.

No verdict has been rendered by the jury in this case up to the time we go to press, but it seems quite probable that they will come in with the usual one in such cases—"mysterious accident," enormous pressure suddenly generated, some nonsense about superheated steam, &c. &c. From the evidence adduced from the examination of disinterested practical men, it appears that the boilers were not properly braced, and exploded in consequence. This is, in plain English, the cause of the disaster. A strain of nearly ten tons was brought upon each iron strap only five-eighths of an inch sectional area, to which the braces between the arches of the fire-box and the flat shell of the boiler were connected, and they naturally gave way in consequence. There were but thirty-two of these straps instead of sixty-four—just half the number called for in the specification, and the disaster which occurred is the result of the omission. By the acceptance of the boilers by the Government, the contractors (the Morgan Iron Works) are relieved from all blame in the matter.

THE DAILY PRESS AND MECHANICAL REPORTS.

In the inquest on the *Chenango* disaster the most ridiculous blunders were repeatedly perpetrated through every paragraph by the reporters of the daily press. We read in the *Times* that iron is "minched," instead of punched; and we hear of "ciphering gages," instead of siphon gages. Mr. Martin is made to say that he "thinks 64 lengths of the hose shown is sufficient to stay my boilers measuring 18 feet by 10 inches, at 60 pounds to her square inch." Mr. De Luce is charged with saying that he thinks 20,000 lbs. a very high estimate for a piece of iron to resist a boiler. It requires as much study to find out what the gentleman testifying *did* say as to arrive at the cause of the explosion. Mr. Martin especially must be highly gratified with the important discovery in staying boilers with "hose," which the reporter fathers upon him.

ON BOILING WATER.

Mr. W. Grove, F.R.S., in a lecture before the Royal Institution, presents some facts on a subject lately brought to the notice of this association. He first alluded to the statements of Donny before the Brussels Royal Academy, in 1843, that in proportion as water is deprived of its air, the character of its ebullition changes, becoming more and more abrupt, and boiling like sulphuric acid with jumps (*soubresauts*), and between each burst of vapor, the water reaches a temperature above its boiling point. To effect this it is necessary that the water be boiled in a tube with a narrow orifice, through which the vapor issues; if it be boiled in an open vessel, it continually re-absorbs the air and boils in the ordinary way. Mr. Grove found that with the oxy-hydrogen gas given off from ignited platinum plunged in water, there was always a greater or less quantity of nitrogen mixed, which led him to examine more carefully the phenomenon of boiling. He arranged two copper wires parallel to each other in a Florence flask, so as nearly to reach the bottom; the lower ends were united by a platinum wire, about an inch and a half long, which was curved horizontally. Distilled water which had been boiled and cooled in an air-pump vacuum, was poured into this flask so as to fill about one-fourth of its capacity. The whole was placed under the air-pump receiver, and a connection was made with the wires of a voltaic battery. In this manner the platinum wire was heated and the boiling continued indefinitely. The effect was curious; the water did not boil in the ordinary way, but at regular intervals bursts of vapor took place, after which the water was perfectly tranquil.

Another experiment was made with a glass tube five feet long and four-tenths of an inch internal diameter bent into a V-shape, into one end a loop of platinum wire being sealed with great care. Into this tube water, purged of air, was poured to the depth of 8 inches, and the rest of the tube was filled with olive oil. The experiment of boiling presented nearly the same peculiarities as those already men-

tioned. It was continued for many hours, and even days. It was found that at each burst of vapor a minute bubble of gas passed up through the oil without being condensed, this was proved to be nitrogen. To avoid any suspicion about boiling by electrical means, similar experiments were made in which the boiling was produced by a spirit lamp, and similar results were obtained.

He was led to try the effect of boiling an elementary liquid, and bromine occurred as the most promising one to work upon. The temperature of the bromine was first raised till its vapor had driven all the air from the glass tube, when the tube was sealed by the blow-pipe. The bromine vapor on condensing left a vacuum above it. After boiling, a notable quantity of a permanent gas was found to have collected in the tube, and this gas proved to be pure oxygen. The experiment was repeated with chloride of iodine with the same result, only the quantity of oxygen was greater. Mr. Grove also described his fruitless attempts to obtain in this way the vapors of phosphorus and sulphur. He barely alluded to the result on the compound liquids, such as oils and the hydro-carbons, as the fact that permanent gas is given off in boiling such liquids would not be unexpected.

The experiments seem to show that boiling is by no means necessarily the phenomenon that has generally been supposed, viz: a separation of the cohesion in the molecule of a liquid from distension by heat. He believes from the investigation he has made that (except with metals, on which there is no evidence) no one has seen the phenomenon of pure boiling without permanent gas being freed, and that what is ordinarily termed boiling arises from the extracting of a bubble of permanent gas, either by the chemical decomposition of the liquid, or by the separation of some gas associated in minute quantities with the liquid, and from which human means have hitherto failed to purge it. This bubble once extracted, the vapor of the liquid expands it; or, to use the appropriate phrase of Mr. Donny, the liquid evaporates against the surface of the gas.

Mr. Grove's experiments are in a certain sense the compliment of those of Mr. Donny. The latter showed that the temperature of the boiling point was raised in the same proportion as water was deprived of air, and that under such circumstances the boiling took place by bursts or jumps (*soubresauts*). Mr. Grove has shown that when the vapor liberated by boiling is allowed to condense, it does not altogether collapse into a liquid, but leaves a residual bubble of permanent gas, and that at a certain point this evolution becomes uniform. Boiling then is not a result of merely raising a liquid to a given temperature, it is something much more complex. Enough had been shown by his experiments to lead to the conclusion that hitherto simple boiling, in the sense of a liquid being expanded by heat into a vapor without being decomposed, or having a permanent gas eliminated from it, is a thing unknown. Whether such boiling can take place may be regarded as an open question. He was inclined to think that it cannot; that if water, for instance, be absolutely deprived of its nitrogen, it would not boil till some portion was decomposed; that the physical severance of the molecules by heat is also a chemical severance. The constant appearance of nitrogen in water when boiled off out of contact with air, almost to the last drop, is a matter well worthy of investigation. He would not speculate on what possible connection there may be between air and water. The preponderance of these two substances on the surface of our planet, and the probability that nitrogen is not the inert diluent in respiration that is generally supposed, might give rise to not irrational conjectures on some unknown bond between air and water. But it would be rash to announce any theory on such a subject—better to test any guess one may make by experiment, than to mislead by theory without sufficient data, or to lessen the value of facts by connecting them with erroneous hypotheses.

ONE hundred and fifty watches per day, or one every four minutes, are now turned out at the Waltham Watch Factory. When the contemplated addition to the company's work is completed, about double the present number of hands—about 550—will be employed.

#### 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:—

**Fluted Ruffles.**—In the manufacture of fluted ruffles and fluted or gauffered trimmings and fabrics generally, it has been common to use, for the purpose of retaining the flutes in place, a thread which, after having been coated with a solution of gum or other adhesive material, is placed in contact with the flutes and caused to adhere thereto. There is no objection to the use of this thread on white muslin goods, but in silk and colored goods the moisture which is in the said thread when it is first applied, frequently produces a stain or discoloration. This invention consists in the manufacture of fluted ruffles without the use of an adhesive thread by pressing down the flutes into a flat or plait-like form at any portion of the width of the ruffle, with such a degree of pressure that the so-pressed portion will retain its pressed form and also the flutes in place, Thomas Robjohn, of Mott Haven, N. Y., is the inventor of this improvement.

**Mowing Machine.**—This invention relates to a new and useful improvement in adjusting or raising and lowering the cutter bar, and in parts connected therewith, to wit, the brace rod and track-clearer. The invention also relates to an improved draught attachment for keeping the cutter-bar free from the surface of the ground, and also in an improved means for connecting the working parts with the axle of the machine, whereby the use of a framing for the purpose is avoided. James Pine, of Troy, N. Y., is the inventor of this improvement.

**Exercising Machine.**—The object of this machine is to obtain a device of simple and economical construction which will admit of the lower limbs of the human body being exercised with a view of strengthening them in cases of paralysis and like diseases, and in such a manner that the patient will not suffer from over-exertion in operating the device, but will only bring such muscles and parts into play which are designed to be strengthened thereby. Charles F. Taylor, M.D., of New York city, is the inventor of this improvement.

**Springs for Cars and other Purposes.**—This invention consists in a series of coil springs of pyramidal form, arranged in rows side by side, each alternate row of pyramids being inverted so as to permit the combination of many springs within a small space. The springs are inclosed in a suitable box or frame, and several series of springs may be employed, arranged above each other with a plate between every series. The boxes are also made in a peculiar manner so as to afford convenient access to any of the series of the springs. These springs appear to possess the merit of strength, durability, simplicity and cheapness. Ulysses B. Vidal, Philadelphia, Pa., is the inventor.

**Improved Revolver Fire-arm.**—The peculiar feature of this revolver is that it is loaded in front of the cylinder with metallic cartridges, requiring neither the taking out of the cylinder nor the opening of the frame, and it is therefore very convenient. The fulminate priming of the cartridges is contained in a flange extended longitudinally from the rear instead of laterally, as in other fixed ammunition. The hammer strikes upon this flange through an opening in the rear of the cylinder to each chamber. The discharged shells are removed from the chambers by means of a sliding pin which is attached to the frame, and is never required to be disconnected from the arm, and therefore can never be lost. As a handy and durable weapon it cannot be surpassed. It is the subject of two patents, and applications on new points are now pending. The cartridge is the subject of a separate patent. This revolver is made of different sizes and in various styles of finish. We have had a pistol exhibited in our office which is one of the handsomest fire-arms we have ever seen; the stock, frame and barrel are most beautifully engraved and heavily plated with silver, the cylinder gilt and the handle made of ivory. It was made by Plant's Manufacturing Co., New Haven, Conn., and is valued at \$75. The inventors of this revolver are Messrs. Reynold's, Plant and Hotchkiss, of New Haven, Conn.

**Concussion-bulb for Fuses.**—This invention consists in the employment for the fulminate priming of

a fuse, of a small glass bulb containing a liquid hermetically sealed and having its exterior coated with a chemical substance. This bulb is broken by the concussion of the shell in striking, and the acid coming in contact with the potash and sulphur produces a mixture which at once takes fire and ignites the charge. George P. Ganster and Isaac S. Schuyler, of New York city, are the inventors of this improvement.

#### NEW BOOKS AND PUBLICATIONS.

**THE MANAGEMENT OF STEEL.** By George Ede. D. Appleton & Co., Publishers, New York.

This work is a re-publication from the second English edition, and its character stands high abroad as a clearly-written and intelligent book upon the subject it treats of, which, it is almost needless to add, is a very important one. The art of working steel is yet in its infancy, and any information which will add to the general stock will be gladly received by all practical persons. This book is especially valuable to many mechanics for the reason that it gives specific instructions upon certain intricate and difficult kinds of work; hardening, annealing, shrinking and forging steel are treated in a lucid and vigorous manner. The author, Mr. Ede, has been for twenty years employed in the Woolwich gun factories of England, and may be considered as an authority upon the subject he writes of. Price 50 cents.

**ATLANTIC MONTHLY.** Ticknor & Fields, Publishers, Boston, Mass.

This excellent magazine deserves more commendation from us than we can find space for. It is gaining popular esteem very rapidly while it steadily maintains its high character as a monthly periodical. The "House and Home Papers" of Mrs. Stowe are not only interesting but instructive, and combine the useful with the sweet in a most agreeable way. In the May number, which we have received, "A Cruise on Lake Ladoga" opens a new country to the eyes and ears of "fireside travelers," or those who, unable to journey abroad, depend upon others for their enjoyment of this kind. For sale at the bookstores.

#### Inventive Progress.

"The progress of inventions is one of the most noticeable features of the day. The SCIENTIFIC AMERICAN of last week had fully three pages of its reading matter filled with inventions for which patents had been granted. These improvements do not relate principally to the destructive art, but sweep over the whole field of industrial activity. Among the names published we notice those of ten or twelve Jerseymen, showing that this State furnishes her "quota" of inventors as well as of brave volunteers. Messrs. Munn & Co., proprietors of that journal, have built up a prosperous business which has outdistanced all competition in both hemispheres. We can recall to mind at least half a dozen attempts made to supplant them as publishers and patent-agents; but all have languished and finally given up the ghost. So much for a conception at the right moment, diligently pursued through successive years, in a spirit of accommodation to the public as well as of advantage to themselves."

[We copy the above from the Paterson (N. J.) Daily Press, a most excellent paper, and we thank Messrs. Wright & Chiswell for their kind testimonial.—Eds.]

#### SPECIAL NOTICE.

LUKE V. NEWTON, of New York City, has petitioned for the extension of a patent granted to him on Aug. 20, 1850, for an improvement in preparing the face of metallic types, engraved plates, &c.

It is ordered that the said petition be heard at the Patent Office, Washington, on Monday, Aug. 1, 1864.

All persons interested are required to appear and show cause why said petition should not be granted. Persons opposing the extension are required to file their testimony in writing, at least twenty days before the final hearing.

A most extraordinary incident occurred during the attack of a rebel iron-clad ram on our fleet in Albatraz Sound. Capt. Flusser, of the *Miami*, fired an 11-inch gun at the iron-clad, which rebounded from the sloping sides and struck the unfortunate officer, killing him at once.