### Little Things that Count.

In every line of business, no matter whether conducted upon a large or small scale, it is the little things that count. The little expenses, the little wastes, the little economies, are the ones that turn the balance of accounts, either for profit or loss, and it is these little things that need the closest attention. The larger, more important details of every business are carefully looked after; there is very little chance for neglect, carelessness or oversight. The workman who spoils a costly piece of machinery, or causes a loss of any considerable account, is held responsible, and is generally very careful in this respect, but in little things he is not as prompt in exercising care and economy, and these little things are looked upon as of no consequence, and as having no real value.

We have heard it asserted by a man who, beginning on barely nothing, succeeded in building up a large and profitable business, and retiring with a considerable fortune, when asked how he had managed, what was the secret of his success, he replied, by saving what other people wasted, looking after the little things and seeing that not a thing was thrown away or cast aside as too small or insignificant to be of any value. A few cents here and a few there make up quite a sum in the course of a year, and it is by paying careful attention to the little details, by looking after the cents, that I have made my dollars.

There is a great deal more in this than most people would be willing to admit. They are in too much of a hurry to make dollars to look out for the cents.

A poor and incompetent or disinterested workman is not only a poor man to employ because he is this, but because he is wasteful and careless about small things. Take some of our very large manufactories, where hundreds of employes are engaged, and, unless the most watchful care is exercised, the amount of waste that is lost would go far toward paying running expenses.

In these times of close competition, when it becomes an absolute necessity that every possible item be carefully turned to account, the exercise of economy in small things is being more rigidly cultivated. Profits at best are only small, and these are made considerably less by the wastefulness of careless and unthoughtful men.

Nor is it alone in the factory or workshop where the necessity of looking after these little things makes itself apparent. The workingman of to-day, with his wages scarcely sufficient to provide for the comforts and necessities of life, has the most need to practice economy in small things, and it is surprising to note what an amount of waste is made by those who have the most need to practice economy. A few cents here and a few there seem mere trifles, and are not regarded as of any particular consequence, or as having any material relation to the annual expenses, but if a careful account were kept for a single year, the result would be astonishing, and just here is where the difference lies between individuals and corporations. The latter have learned by a comparison of the strict accounts which are an absolute necessity with them, the lesson of economy in small things. Everything is put down and can be looked over and studied, and its effect upon the total noted, and this is a lesson which should be learned by individuals, and workingmen especially. By them, as a rule, no account of daily expenses, or even any expense, is kept. They receive their money, and it is spent. At the end of the year not one of them can tell where his money has gone, or for what purpose, whether he has made a profit from the time and labor expended, or not; and for this reason, as well as that he may see where and how he may economize and save something, even if only a small amount, the workman should keep a strict and careful account of daily expenditures and receipts.

Such a course would not only result beneficially to him personally, but would make him a more careful, painstaking and valuable employe. Carelessness at home or of one's personal interests breeds carelessness of others' interests, and there is nothing which an employer notices more quickly, and is more willing and ready to appreciate and reward, than the display of care and interest in the little details by a workman.

It cannot be expected that a man who is careless of his own welfare and interests will exercise any more care than he is obliged to do under the watchful eye of the foreman or proprietor, or care for those of his employer.

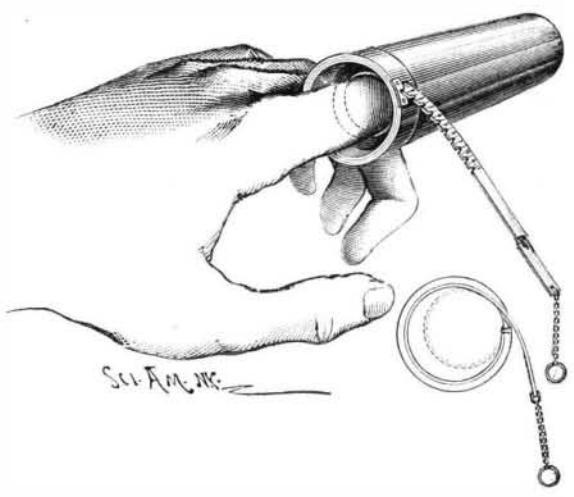
It is, then, all-important that every individual exercise this watchfulness of the small things in business and in private life. The employer must guard himself against loss by the carelessness and wastefulness of his employes. The employe should be equally vigilant in his own personal interests, and all should remember that it is the little things that count.—*Manufacturers' Gazette.*

THEY are making excellent wool out of the fiber of the fir-tree by means of electricity. The time is now come when the lamb may as well lie down with the lion.

### NOVEL FINGER RING GAUGE.

The common method employed by jewelers for measuring the finger to be fitted with rings is to apply a number of independent rings to the finger until one is found of the required size. This operation, of course, occupies considerable time, and is not perfectly accurate.

We give an engraving of a new ring gauge recently patented by Messrs. Ethelbert Wareham and W. F. Doll, of Winnipeg, Canada. This gauge consists of a conical metal cap of convenient size to be held in the



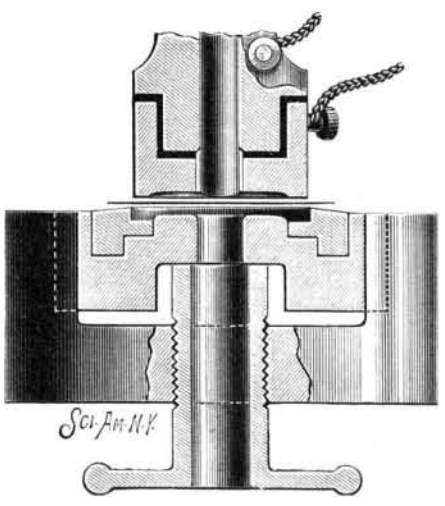
NEW RING GAUGE.

hand, and of larger diameter than the largest finger to be measured. In this cap is placed a string tape measure, with one of its ends attached to the interior of the cap, while the other end projects through a slot in the cap, and is provided at its extremity with a chain and ring. The tape measure is provided on its outer surface with a scale, and with notches in its edge corresponding with the graduations of the scale. To the surface of the case at the side of the slot is attached a stop plate, which is received in the notches of the tape measure.

The finger to be measured is inserted in the case, as shown in the larger view of the engraving, and the tape is drawn out until its inner portion encircles the finger, when the graduations appearing opposite the stop plate will indicate the number of the ring required.

### IMPROVEMENT IN THE ART OF SHAPING SHEET METAL.

In spinning or stamping sheet metal, most metals require frequent annealing, while it is necessary to work some of them, such as zinc, while warm. To obviate



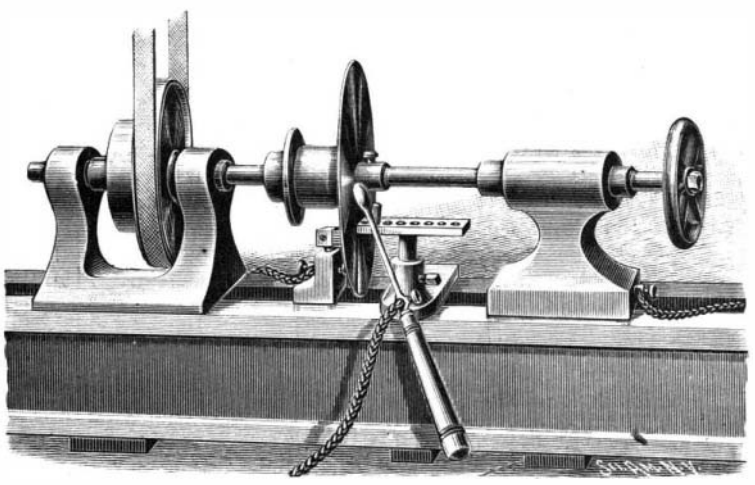
ELECTRICAL DRAWING DIES.

the necessity of frequently heating the work, Mr. Mark W. Dewey, of Syracuse, New York, has devised improvements by means of which heat can be locally applied. The invention is designed to be adapted to metal-spinning lathes, to drawing dies, and to other sheet metal working machines. The source of heat is a current of electricity, which must of necessity have a large volume and low electromotive force.

In the case of a spinning lathe, the current is applied to the work through the mandrel, in case it is of conductive material, or if it is of wood or other non-conductor, it is applied through a brush which touches the back of the plate. A conductor also extends to the spinning tool, so that the current must pass into the plate at the point of the tool. The resistance of the contact and of the material of the plate is sufficient to produce the heat necessary to anneal the metal, so that the process of spinning can be carried forward without interruption until the work is completed.

In the case of the drawing dies, the lower portion of the upper die is insulated from the other part, and connected with an electrical generator, so that when the die touches the metal sheet, it forms an electrical connection. The punch by means of which the drawing is done passes through the upper portion of the die, which is connected electrically with the other conductor of the generator, so that the current flows through the lower part of the die, through the plate, through the punch and back to the generator, thus producing at the point of contact between the punch and the plate the heat necessary for annealing.

This invention is particularly adapted to the manufacture of cartridge shells and the drawing of tubes.



DEWEY'S IMPROVEMENT IN METAL SPINNING.

### The Atmosphere of the Sun.

Mr. J. Janssen, on the 22d of September, gave the French Academy of Sciences an interesting account of his recent excursion to Mont Blanc, the object of which was to solve the much controverted question of the presence of oxygen in the solar atmosphere. This question is one of the most important that celestial physics can propose, by reason of the immense role that oxygen plays in geological and chemical phenomena, and especially in those upon which depends life in all its forms. Therefore, much attention has been paid to it for a long time, but, as is well known, it has always remained undecided.

Summing up the spectroscopic observations made during this ascension to the summit of Mont Blanc, Mr. Janssen states that they complete and confirm those that he began two years ago at the station of the Grands Mulets at an altitude of 3,050 meters, and that these observations as a whole, that is to say, those made between the Eiffel Tower and Meudon, those of Mr. De la Baume Plurinel at Candia, those of the laboratory, and finally those of this year on Mont Blanc, unite in leading to the conclusion that there is no oxygen in the gaseous solar envelopes that surmount the photosphere, at least no oxygen with a constitution that permits it to exert upon light the phenomena of absorption that it produces in our atmosphere and which are shown in the solar spectrum by the system of rays and bands that are known to us. Mr. Janssen considers that this is a definitely determined fact, whence may be drawn certain conclusions touching the constitution of the solar atmosphere.

It is certain that if oxygen existed simultaneously with hydrogen in the external envelopes of the sun and accompanied it to the remote limits where we observe it, that is to say, to the coronal atmosphere, the ultimate cooling (in a period of time that we cannot yet estimate, but which it would seem must inevitably occur when our great central furnace begins to exhaust the immense reserves of force that are still at its disposal) would have the effect, if the oxygen and hydrogen were in presence, of bringing about their combination. Aqueous vapor would then form in these gaseous envelopes, and the presence of this (from what we know of its properties) would have the effect of offering quite an obstacle to the sun's radiations, chiefly its heat radiations. Thus, the reduction of the solar radiation would be further accelerated by the formation of such vapor.

### Volcanic Silver.

The existence of silver in volcanic ashes is of rare occurrence. Only in two cases have argentiferous ashes been met with. The first sample was obtained during an eruption of Cotopaxi, in July, 1885, in the ashes of which Mr. J. W. Malet proved the existence of one part of silver in 83,000 parts of ashes. In the following year the same investigator was able to add a second instance. In January, 1886, a violent eruption of Tunguragua, in the Andes of Ecuador, between 50 and 55 miles from Cotopaxi, took place, the eruption continuing at longer or shorter intervals up to November of the same year.

The ashes thrown up by this volcano, which had been at rest for over a century, contained silver to the extent of one part in 107,200 parts of ashes. This appears, at first sight, to be only a very small percentage of the metal. But when it is considered what enormous quantities of ashes are erupted, and what a vast extent of area they cover after an eruption, the quantity of the silver thrown up with them must be considerable.

### Antiquity of the Carpenter's Plane.

A very interesting discovery has been made at the Roman city of Silchester. The excavators came across a dry well, which on being explored proved quite a little museum of antiquities. Some 15 feet down, a *Times* correspondent says, the diggers found an urn-shaped pottery vase, about a foot in length, quite intact, and, curiously enough, protected by lumps of chalk built around it. The vase, which probably originally contained some precious substance, was, however, quite empty. Above it were deposited a great number of iron implements, most of which were in a wonderful state of preservation. They seem to have been the tools of a carpenter and a coppersmith or silversmith, with some miscellaneous objects of blacksmith's work thrown in. The principal specimen is a carpenter's plane of quite modern type, although unquestionably more than 1,500 years old, three or four axes retaining their fine cutting edges and still quite serviceable, a number of chisels and gouges of all shapes and sizes, hammers, adzes, saws, files, etc. In the smith's department may be specified a brazier for burning charcoal, quite complete, two or three anvils of different sizes and shapes, a fine pair of tongs adapted for lifting crucibles, a curious tripod candelabrum lamp, or candlestick, and several other curious objects the precise uses of which have not yet been determined. In addition there are several large bars of iron, a couple of plowshares, and a broken sword. Probably more will be found deeper down in the well. This is undoubtedly the most important find at Silchester since the discovery of the bronze Roman eagle, now at Strathfieldsaye, some years ago.

### Baking Powders Once More.

Many combinations of chemicals have been proposed and tried for baking powders, but the general consensus of housekeepers, as well as of scientific authorities, has settled upon a mixture of sodium bicarbonate (baking soda) with potassium bitartrate (cream of tartar).

Were the above mixture of chemicals allowed to stand, it would soon deteriorate. To prevent this it is mixed with an inert substance which isolates to some extent the particles of the mixture, so as to confer lasting powers upon it. This substance is usually flour or powdered starch, and is termed "filling." Some filling is necessary. About 10 per cent is the least that can be used by the most careful manufacturer, and all over 18 per cent should be considered an adulterant, harmless, indeed, but nevertheless an imposition on the consumer.

Twenty-one baking powders are cited in the United States Department of Agriculture report on foods and food adulterants, Washington, 1889, as exceeding this amount. The amount of starch varies from 24·57 to 52·29 per cent, which goes to show how much starch is bought and paid for at the price of baking powder. All but two of these contain ammonia or alum, or both, and are in the list of powders given below.

A more important point, however, is to know what baking powders are adulterated with alum or ammonia, as the continued use of such powders, according to many authorities, injures the health.

The use of alum in baking powder has been prohibited in England, France and Germany, and a law has recently been passed in Minnesota requiring manufacturers using alum to publish on the label, "This baking powder contains alum;" and the Canadian government report says (page 27): "The residues left in the bread after use of an alum powder are sulphate of ammonia, sulphate of soda, and alumina. The last named is an earthy substance quite insoluble and therefore indigestible." (Page 31) "Alum is entirely objectionable as a substitute for cream of tartar, and ought not to be allowed a place in any well appointed bakery."

The insidious effects of ammonia as an adulterant in baking powders are not so well known, but Bartholow sums up the evidence against ammonia as follows: "The long-continued use of ammonia impairs digestion by neutralizing the gastric juice. Increased waste of tissue is also one result of its administration, manifested by pallor, emaciation and feebleness." And the *Pacific Medical Journal*, commenting on the cause of dyspepsia, says (page 687): "This question regarding the effect of ammonia upon the human economy is one upon which authorities do not differ, and the individual experience of every physician is in accord with the assertion of authorities. The agent (ammonia) is a drug, not a food; an excrement, not a nutriment. The amount received by the system through these means, while not great at any particular time, and not sufficient to prove injurious, becomes both great and deleterious by being continuous. Physicians owe it to their patients and to the people generally to inform themselves regarding this matter, and without fear or favor unqualifiedly to condemn injurious preparations; and the various boards of health throughout the State, in dealing with the question of food adulterations, would do the people a great service to look well to the brands of baking powders containing ammonia and other injurious ingredients."

In the face of such testimony, quantities of ammonia are used, one company, it is estimated, using every year in the manufacture of their baking powder two hundred and fifty thousand (250,000) pounds. It is a common right of the people to know what food compounds contain. There is, however, no law to that effect at present, and for the protection of the public we have compiled a list of baking powders containing ammonia and alum, from five official reports, viz.: United States Department of Agriculture, Bulletin No. 13; Inland Revenue Department, Canada, Bulletin No. 10; Ohio Dairy and Food Commission, New Jersey Dairy Commission, and the Massachusetts State Board of Health. It is a list worth preserving.

#### AMMONIA AND ALUM BAKING POWDERS.

*Compiled from Official Reports.*

Powders marked with a star seem to have a general sale, as they are mentioned in at least two of the official reports.

| | | |
|---|---|---|
| American Gilt Edge | Forest City | Pearsons |
| *Atlantic & Pacific | Four Ace | Perfection |
| Aunt Sally | Gem | Peerless |
| Brooks & McGeorge | George Washington | Pride of Ottawa |
| Brunswick | Globe | Pride of Toronto |
| Buckeye | Gold | Princess |
| Burnett's Perfect | Golden Sheaf | Purity |
| Can't Be Beat | Grape | *Royal |
| Capitol | Great Eagle | Scioto |
| Carlton | *Henkel's | Silver Cream |
| Centennial | Higgins | Silver Queen |
| Challenge | Holyoke | Silver Spoon |
| Cook's Acme | Hygienic | *Silver Star |
| Cook's Best | International | Silver Thimble |
| Cook's Choice | James | Snowdrift |
| Cook's Favorite | Jersey | Sovereign |
| Cook's Finest | *Kenton | Springfield |
| Coral | Lincoln | Star |
| Cottage | London | State |
| Crown | Mason's | Standard |
| Crystal | Metropolitan | Sterling |
| Daisy | Miles | Sun Flower |
| *Davis O. K. | New Era | Superior German |
| Dixon's | Ocean Foam | Veteran |
| Dooley's | Ocean Wave | Vienna |
| Dy Yeast | Old Colony | Washington |
| Eclipse | One Spoon | Welcome |
| Empire | On Top | Wheeler's |
| Enterprise | Oriole | White Star |
| Eureka | Our Best | Windsor |
| Feather Weight | Our Own | Zipp's Grape Crystal |
| Fleur de Lis | *Patapsco | |

In the U. S. report, the results of analyses by Prof. H. A. Weber, made for the Ohio Dairy and Food Commission, and by Prof. H. Bedinger Cornwall, of Princeton College, N. J., for the Dairy Commission of New Jersey, are cited, as well as those by Dr. H. W. Wiley, Chemist of the United States Department of Agriculture. This gives a peculiar value to the report, which of course contains a great deal which cannot be summarized here.

One prominent powder is reported by all authorities as free from anything that could be considered an adulterant. Cleveland's Baking Powder is reported as a pure cream of tartar powder, containing about 10 per cent of filling, and yielding a large amount of carbonic acid gas. On this latter factor depends its strength, or leavening power. According to the four authorities mentioned, Cleveland's powder gives the following percentage of carbonic acid gas: Ohio, 12·80 per cent; New Jersey, 13·57 per cent; United States, 12·58 per cent; Canada, 12·57 per cent; which is an average of 12·87 per cent, a high average, equaled by no other cream of tartar powder examined.

Its constancy of composition is also strongly testified to by the Canadian report. All things considered, it may fairly be said that Cleveland's Baking Powder makes the best showing in the reports of these four authorities. Its absolute freedom from anything in the nature of an adulterant cannot be too strongly emphasized. It contains, according to the official reports which we have quoted, no adulterant whatever, and by the different chemists is shown to possess a remarkably uniform leavening power.

This quality of uniformity is of importance. In adding a given proportion of baking powder to flour, it is essential to know that a definite amount of gas will be produced. Otherwise many spoiled products will result. The showing Cleveland's makes, compared with all the principal brands, is such as to put it emphatically at the head of the list.

### The Growth of Incomes.

Mr. Russell Sage has been interviewed by the Wall street *Daily News* about Jay Gould and his fortune. He said: "There is not a man in America or the world at large who absolutely owns and controls, and has registered in his own name, as many stocks as Mr. Jay Gould. It is no exaggeration to say that he draws more revenue from his invested capital than does any other living soul.

"In order that some idea may be had of his wealth, it is simply necessary to take three of his stocks: Manhattan, of which he owns and has registered $10,000,000, Missouri Pacific $12,500,000, and Western Union $25,000,000. Of these three, independent of his vast number of bonds and other dividend-paying securities, he draws for dividends over $2,000,000 a year. His income from other sources, of course, amounts to four or five times as much.

"People do not appreciate what the amount of an income of a man like Mr. Gould means. It will be readily seen that he cannot commence to use for his own personal use even a small part of the interest which the dividend money alone would yield. He must reinvest it, and he does reinvest it. When you consider that there are scores, and I might say hundreds, of people whose yearly rentals, dividends, interest on bonds, etc., amount to, well, from a half million to two million dollars a year, it will be readily seen that they have considerable surplus to put into new investments. The creation of securities which continually goes on indicates that there are plenty of people who are willing to put their money into them."

### Two Cases of Lightning Stroke.

BY PROF. H. S. CARHART.

In the neighborhood where I lived when a boy, a barn, which I remember well, was struck by lightning a few weeks since and burned. This barn did not stand on elevated ground, but on the border of rather low meadow land, and was surrounded with hills, except on one side. The special point of interest attaching to the case is one touching the protection afforded by lightning rods, coupled with the additional fact that, notwithstanding the old adage, lightning does sometimes strike more than once in the same place.

Twenty years ago and more this particular barn was provided with an iron rod, which was carried down on glass insulators and into the ground at the end of the barn where the earth, a heavy clay soil, was always moist and generally wet. My brother, who lived there for several years and was familiar with the place, testifies that not infrequently after a heavy thunderstorm there was undoubted evidence that the rod had been struck, for the earth had been thrown away from the lower end of the rod to a depth of some six inches and for a considerable lateral extent. Just how often that occurred was not noted, but it was often enough to attract attention. My brother removed from there many years since, but I heard the same report recently from a reliable old gentleman who has lived there nearly all his life.

For some time the rod has been out of repair, and it was finally removed from the barn. How long since that occurred, I did not learn. But recently the lightning apparently struck the weather vane and set fire to the barn. While the rod remained on the barn, the evidence is strong that it carried more than one lightning discharge safely to earth.

Another case was related to me. A few miles from the barn referred to was a church, which at one time had a rod running from the spire to the ground. But in the course of time the rod became separated somewhere on the roof and was left out of repair, probably because of insufficient faith in lightning rods. This lack of faith was somewhat dearly paid for, because lightning struck the rod, was carried safely down as far as the attached end; thence downward, it expended its energy on the building. It was not fired, but damage to the extent of several hundred dollars was done. The cases above, in which the lightning discharge followed the rod, may have been instances of Prof. Lodge's "steady strain," and not of the "impulsive rush" variety. But both go to show the usefulness of rods properly erected and in repair. Both accidents happened only after carelessness allowed the rods to fall into what was doubtless thought to be "innocuous desuetude."—*Western Electrician.*

### Hope for Bald Heads.

Dr. P. A. Morrow, at a meeting of the N. Y. Academy of Medicine, said he had had no personal experience with Thiersch's method. He had used grafts very much thicker than those mentioned in the paper—grafts which included not only the entire thickness of the derma, but also subcutaneous tissue beneath. He had been led to do this in the case of a man who had become somewhat hypochondriac because of a scar on the scalp, which in later years became exposed from scarcity of hair. He first took grafts from the patient's own scalp, on the opposite side, by means of the cutaneous punch, and immediately transplanted them into holes of the same size made by the same instrument in the scar tissue. Very much to his gratification, union was perfect within a week. Four grafts were first made, and he waited several weeks to see whether the hair would grow. It did. He then made transplantations from another patient's scalp, and these also grew and bore hair luxuriantly. The grafts were fully a quarter of an inch thick. There was no suppuration, no untoward result. He had employed the same method in one or two cases of epithelioma, and, while there was no indication of breaking down, there had not been sufficient time to justify conclusions. He thought the method had a wider field of application. For instance, it might be adopted in lupus, and in removing moles, warts, and other facial blemishes.—*Med. Record.*