Correspondence.

Employers and Trade Unions in England.

To the Editor of the Scientific American:

As I told you in my previous communication (published in your last issue), the workman Tom continued in his course, determined to let the matter work itself out; but while he was in this state of mind, matters assumed an entirely new phase, inasmuch as the foremen began to urge the day work men to do more work, complaining that the cost of day work must be made to approximate that of piecework. Some men were reduced by being put back from the erecting pits to the fitting benches, one or two were threatened with dismissal, and apprentices just out of their time were not given the full amount of the usual rise in their wages. One old hand, who had performed some twenty years of service under that company, and nearly all of it in the same shop, had his wages reduced, and the whole shop became, as it were, in an uproar, Tom was charged with injuring his fellow workmen; he replied that he had nothing to sell but his labor, and he had a right to realize the most of it that he could; and he was answered that no man had a right to injure a whole community, that the rights (and even the privileges) of the individual were ignored by governments when the welfare of a community demanded it. He was told how the discoverer of gold in California had his lands seized by the people, and had been utterly unable to obtain any redress at the hands of the courts. Another said: "See here! I was engaged to work for this company; I have given them satisfaction for years; I am doing the same amount of work that I always did, but I no longer give satisfaction. I am given to understand that I must do no more work for the same price. I would not object to your doing what you like with your labor; but when you are set up as a standard by which I am to be measured, a standard by which we are all to be measured, to our detriment, what are we to do?" Still another said: "Do not you see that your perseverance and skill are merely taken advantage of to our detriment? You are not given any credit for any unusual ability, but our employers set you up as an average, and say that, if you can do so much work, others must do it. Doctors and lawyers have legal charges which they can enforce, the one so much a visit, the other so much for each professional service; but we have no protection whatever." Tom replied that he was not answerable for the actions of the company, and that in a matter of business he had a right to consult his own interests only. They replied that it was a matter of business to them also, and that they had a right to consult their interests only. The result of his work had been a business detriment to them, and he must thereafter expect no favor from them.

Here was an entirely new disturbance. The foremen got into difficulty, the superintendent said that it looked badly on the books for a workman to be making so much money, and also for one man's work to be done so much more cheaply than another's. The foremen were unable to get others to either take piecework at Tom's prices, or to make day work cost anywhere near that of his. They therefore looked upon Tom as the cause of their troubles also, and dealt with him in no very friendly spirit. In the meanwhile, Tom employed another man to work for him and sometimes two, and at times an apprentice. Among the apprentices was a certain young gentleman (who is now the master mechanic of a railroad not a hundred miles from Williamsport, Pa.), who was an earnest and assiduous worker, and probably the most skillful of Tom's assistants, and who will probably recognize the subject of this letter, since he was cognizant of nearly the whole of the contest. The result of the foremen's displeasure was that Tom was likely to lose his position. He learnt that it was to be urged upon the superintendent that the disturbance created in the shop by piecework was more detrimental to the company than was the piecework advantageous. The claim was probably not without foundation, since Tom was on his entry to the shop greeted with ringing of hammers on iron plates, the erection of a gallows frame in his vise, shouts, and other similar salutations, the better class of workmen looking upon these demonstrations with pleasure, but holding aloof; the inferior ones helped the folly, hoping it would intimidate Tom; the apprentices entered into it with a gusto, half from deviltry and half from a desire to become popular among the men. Then the groups of workmen and apprentices would argue the question, *pro* and *con*, and would not, as a rule, commence work till one or the other of the foremen appeared. This aroused in Tom a direct spirit of opposition; he took more piecework, cut down the prices still lower, and still he earned more than the regulation "time and a half." His work was repairing and making new work for old engines. A few men were continually engaged in building engines by piecework, and thus it often happened that, at the time that Tom was doing a certain job for one engine, another man was doing similar work from the same drawings for another, the castings being from the same patterns. Tom's price was, as the books of the company attest, never less than 25 per cent lower than that of the men referred to; and yet, because Tom earned more money, or, in other words, because he did more work, he was harassed by his employers, and came into indirect conflict with them, by reason of their insisting upon his voluntarily reducing his prices, although his rival was not even requested to reduce, and was *allowed to continue at the old price, although he did not do so much work.* He did not earn so much money, and was therefore considered to have committed no offence.

It has not been attempted, in this letter, to show the bitterness attending Tom's struggle, both with the workmen and the foremen, but merely to illustrate the difficulties of the piecework system; but Tom finally decided to go to the United States, and, wishing to have an introduction to some one there, called upon Mr. Zerah Colburn, then editor of *Engineering*, a mechanical newspaper well known to your readers. Mr. Colburn had heard of Tom, and gave him letters of recommendation to several prominent engineering gentlemen in the United States. I subjoin an exact copy of one of them:

London, 11th day of February, 1867.

MY DEAR SIR:

Mr. ———. who will hand you this, has been engaged for some years at the ——— railway works. He has taken by piecework almost every part of the finished work of locomotives, and I believe he has succeeded very well at moderate prices. Indeed he has brought down the displeasure of the union men, with whom the workshops of this country are unfortunately overrun, for having been more industrious and therefore more prosperous than their regulations allow of. He has determined to go to America; and I trust that, if you cannot find a place for him, you may be able to recommend him, as I think you may with confidence as a hard-working, capable, and valuable man. In this latter case, will you kindly return to him this letter, and endorse it to any of our mutual acquaintances whom you think likely to further his wishes? ZERAH COLBURN.

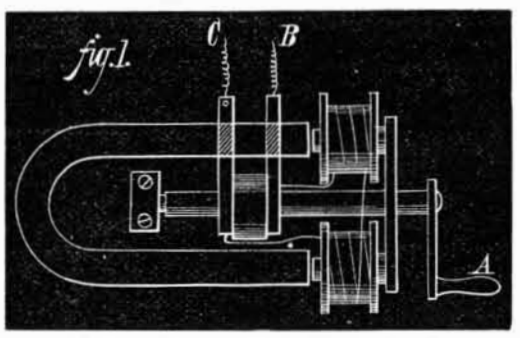
Tom came here, found immediate employment, and in a very few weeks was working piecework; but in less than two years he found that "so much work for so much money," as illustrated by the piecework system, is (as a means of advancement) a delusion and a snare, since his value as a workman was sufficient to render his employment in a higher position questionable in a money point of view. Tom, however, still believes that piecework, carried out with a desire on the part of both employer and workman to be reasonable and just, would be a decided advantage to both.

New York city. PIECEWORK.

Some Further Electric Experiments.

To the Editor of the Scientific American:

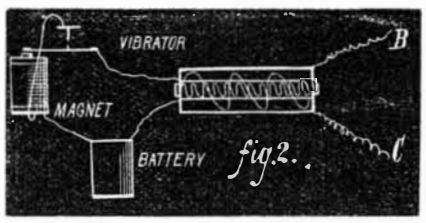
I send you notes of three electrical experiments, which any of your readers can try for themselves. Fig. 1 represents the common magneto-electrical machine in general use



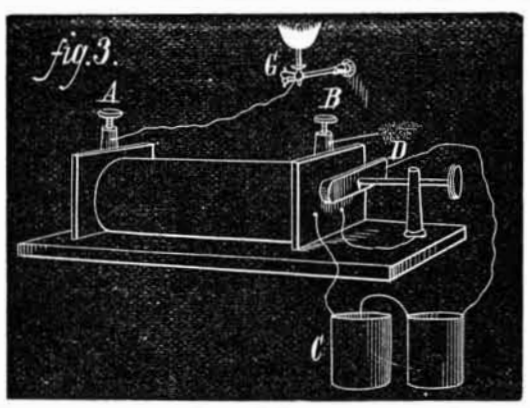
By turning the crank, A, sparks can be obtained either at B or C. These sparks can be obtained at the free or open end of a conductor, by proper connection.

Fig. 2 represents common voltaic induction, and the sparks can be obtained either at B or C, and transmitted the same as by the magneto electrical machine, but with better results.

Fig. 3 represents the Ruhmkorff induction coil. C is the battery, D the vibrator, and A and B the ends of the fine wire



or second coil. Sparks can be obtained at either A or B, by touching the knob with a wire or piece of metal. A physiological effect can be obtained by slightly touching the free or open end of the wire leading, from either A or B, to the end



of the tongue. It makes no difference from which, A or B, you lead the wire, the spark will appear; and of course, by touching A and B together, you have the common result of the coil. Connecting A to the gas pipe, G, thereby grounding the whole coil. does not affect the sparks or physiological effect at B, or their transmission through conductors. The sparks can be made to produce mechanical effects in this form, and they can be made to produce mechanical effects similar to those obtained by Mr. Edison. M. B.

A Freak of Nature.

To the Editor of the Scientific American:

In a forest in the vicinity of this place, there are two trees of the variety known as red oak, which, at about 12 feet from the earth, are united by a limb growing from one to the other. The trees are about 2 feet 6 inches apart. The one from which the limb extends is 44 inches in circumference near the earth, 41 below the limb and 36 above. The other is 26 inches in circumference at the stump, and 24 below and 33 above the junction with the limb, which is 22 inches around. In the large tree, the trunk is healthy below the limb, but the top evinces signs of decay. The top of the small one is healthy and flourishing, while its trunk is nearly dead, and has scarcely grown an inch in several years. The large tree is about 30 feet high, and the small one over 40.

If any museum would like to obtain the specimen, it will be put on the cars at Farley, addressed to any person who may give me necessary directions.

Farley, Iowa. W. J. MCGEE.

Wells of Mineral Water.

To the Editor of the Scientific American:

It is well known that mineral water in wells, by reason of its greater specific gravity, sinks to the bottom, while water which contains little or no mineral floats to the surface. Hence it is impossible to obtain pure water by the use of the common pump: for since the pump draws from the bottom, it must of course draw the mineral water first, leaving the pure water in the well. To remedy this, I suggest the following:

Provide a piece of ¾ inch oak plank about 15 inches square, and boil it well in clean water to remove the sap. Procure a piece of rubber hose about 1¼ or 1½ inches in diameter, and of sufficient length to reach from the bottom of the well to the surface of the water when at its highest point. Split one end of the hose in halves to the length of 3 inches, open the mouth thus formed about 2 or 2½ inches, and join it to the center of the square plank by means of tacks through the edges of the lips, the slots on the two opposite sides being distended at least 1 inch. Attach the other end of the hose to a spile of 1¼ inch bore inserted in the pump stock about 10 inches from the bottom, stopping up all other water inlets below the surface. The hose may be lashed on the spile with a well waxed cord. Introduce the pump, with the hose thus attached, into the well, allowing the plank supporting the upper end of the hose to flat on the surface, and the pump is ready for use.

The advantages of this plan are that, as no water can enter the pump but through the slots in the hose under the plank, all the pure surface water will be drawn off before the mineral water is reached, and no *débris* or sediment of whatever kind can enter the pump from below, nor floating foreign bodies from above. And the floating plank will rise and fall with the varying hight of water, so that none but surface water, the purest in the well, can be drawn.

Alma, Ohio. J. TAYLOR.

Value of the Scientific American.

To the Editor of the Scientific American:

In your issue of January 15, current volume, is an extract headed: "Make a Note of It!" My advice to everybody is, instead of keeping a notebook and pencil always ready, and looking very much like a city local reporter, subscribe, like a sensible man, to the SCIENTIFIC AMERICAN, read it carefully and then lay it away. I can assure you that, if anything worth making a note of is published, it will be sure to come out in its volumes; and by looking over back numbers, as well as the new ones as they come out, any one will be sure of finding anything that is worth making a note of. I have found it so during the few years that I have been taking your journal, and for my small business it has been as good as a large cash capital. "Knowledge is power."

Wilson, N. C. H. B. BENTON.

Electricity as an Executioner.

To the Editor of the Scientific American:

In your paper of January 8 is an article on the above subject. It is very suggestive. Should the electric fluid be used to shuffle off the mortal coil of criminals, the judge in pronouncing sentence would have to say: "The sentence of the court is that you be taken to the county jail, and thence to the place of execution, where you will be struck with lightning until you are dead, dead, dead!"

We might go still further with improved methods of dealing with culprits. Experiments could be made to determine whether human beings could be frozen in such a manner that life would return when the body was thawed out, as is the case with fish and other animals. If successful, instead of long imprisonment at the expense of the State for food and clothing, and the risk of escape, criminals could be securely incased in blocks of ice, and stored away in refrigerators during their allotted term. Had Tweed been thus immured, there would now be less anxiety about him. Then, again, any one dissatisfied with the hard times could step into the machine, and request a friend to block him up in ice until specie payment was resumed.

The length of this kind of improvement would add years, but not age, to the prisoner. With proper care, we should be immortal. A hundred years would be as one day. Troublesome mothers-in-law could be disposed of for a time, care being taken not to break them in two in the act of storing. S. BROWN.

Philadelphia, Pa.

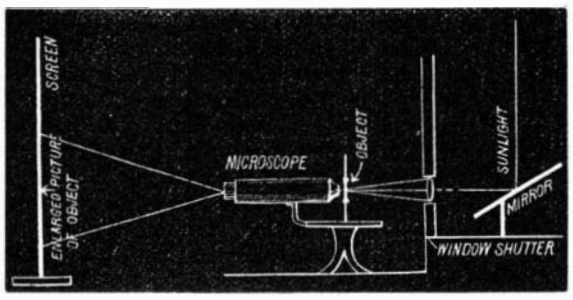
Enlarged Images Projected on a Screen with a Microscope.

To the Editor of the Scientific American:

In your issue of December 18 (Notes and Queries, No. 43) you say that a person cannot throw an enlarged image on a screen with a compound microscope. It had been my good fortune to listen to a course of lectures, by Professor Bolles

on the microscope, in which he stated that he produced some of his images on the screen in that way. To confirm my impression, I wrote to him and received the following:

"The answer in the SCIENTIFIC AMERICAN is only true in one way. It is true that you cannot use the microscope to project objects to any size on the screen, if you use the ordinary illumination employed for viewing objects, because the light (a gas jet, a candle, ordinary daylight, a kerosene lamp) is not intense enough to give a bright picture when diffused so much as it must be on the screen. But if you increase your illumination, you can project the smallest objects which the microscope can show. The enlarged objects which I showed in New Bedford were projected from a microscope placed in front of the calcium light. Dr. J. J. Woodward, of the Army Medical Museum in Washington, has done the finest work of this kind. He uses sunlight, thus:



You can see the object on the screen; and if a photographic plate be substituted for it, a negative can be taken. In this way Dr. Woodward has photographed the most difficult things, such as Nobert's 19th band, five-lined diatoms, etc. His results, published by the government, are the best in this way in the world. A great deal of this sort of thing has been done, and almost any book on the microscope has something about it. Any microscope and any lens can be used if there is a light intense enough. I often photograph microscopic objects direct from the lantern. E. C. BOLLES."

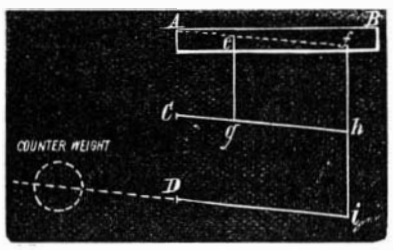
I believe this will be interesting to your many readers.

New Bedford, Mass. D. W. C.

To Describe a Circular Motion Around an Inaccessible Center.

To the Editor of the Scientific American:

The following problem recently came up in practice. It became necessary to tip the leaf of a bench or table about an axis which was inaccessible for using a hinge or trunnion. Sliding arcs as guides were also inadmissible, and nothing should project above the surface of the table. The device shown in the engraving accomplishes the object.



A B is the leaf to be raised or lowered about the corner, A. C and D are pivots upon a fixed frame. C *h*, D *i*, and *if* form the well known parallel motion. Upon C *h* is erected the connecting link, *g e*, completing the movement. In construction, A *f*, C *h*, and D *i*, should be equal, $g\,e = h\,f$, and $g\,h = e\,f$.

Smithville, N. J. JOHN SALTAR, Jr.

Mr. Edison's New Force.

To the Editor of the Scientific American:

I notice in your SUPPLEMENT No. 5 an article upon the "phenomenon of induction," by Professor Houston of Philadelphia, copied from the *Journal of the Franklin Institute*, in which he claims that etheric force is nothing but inductive electricity, and that he observed the same phenomenon in 1871. He attributes my failure, to obtain indications with the test instruments used, to the fact that the positive and negative currents from the vibrator followed each other with great rapidity, and thus prevented the instruments from responding. In reply, allow me to state the gentleman is entirely wrong in his conclusions, and that he cannot be familiar with the extra currents of low resistance magnets; otherwise he would have known that, upon connecting the battery, the extra current is provided with a circuit in which it may pass, consisting of the battery, connecting wires, and electromagnet. Under the conditions by which I obtain etheric force, no spark should theoretically be obtained, even if it were due to extra current upon closing the circuit; and in all my experiments none has ever been obtained. Neither is the brilliancy of the spark reduced by replacing the iron core of the electromagnet (used in one form of experiment) with a copper one, which should be the case were the spark due to extra current.

In regard to the Professor's claim of priority, I have on every occasion stated that the spark has been observed by electricians for many years, and attributed by them to inductive electricity; and all that I can lay claim to is that perhaps (if that is not too strong a word) I was the first to discover that it was not due to electricity.

In conclusion, I suggest that, as I have freely laid myself open to criticism by presuming to believe in the capacity of Nature to supply a new form of energy, which presumption rests upon experiment, it is but fair that my critics should also back up their assertions by experiment, and give me an equal chance as a critic. T. A. EDISON.

Newark, N. J.

The Nature of the Phenomena Discovered by Mr. Edison.

To the Editor of the Scientific American:

Allow me to correct a slight typographical error in the last paragraph of my article on page 39 of your current volume, where it said: "Another argument that this force is not electricity itself, and is only related to electricity," etc. This makes me say the reverse of what I wished to convey. It should read: "Another argument that this force, if not electricity itself, is related to electricity only, and not to heat," etc.

New York city. P. H. VANDER WEYDE, M.D.

Sixty Quails in Sixty Days.

We wonder if there is anything epidemic in the desire to eat thirty quails. Two or three weeks ago we found a story about some one in Indiana accomplishing that most nauseous of gastronomic operations, and transferred the recital to these columns. Now come two Frenchmen in Louisville, Ky., who have been trying their hands, or their stomachs rather, at the same proceeding, and they also have succeeded. We are beginning to lose faith after all in the assertion that the task is difficult: at all events, it is one which has been mastered, apparently, by the indomitable will of the Gallic gourmands.

But this is not all. One of the twain, after smacking his lips over quail No. 30, sighed, Alexander-like, for more quails to conquer. Thirty quails had glanced harmlessly from that flinty stomach, and the hero of the astonishing organ felt justified in beginning on quail No. 31. He continued until five birds had been engorged, and then outraged nature rebelled; but with a burst of that gigantic will, which, in Napoleon, surmounted the rocky barriers of the Alps, the intrepid eater hurled himself upon the seventh bird, and, in his own words, "chewed him up, bones and all." Like the old guard at Waterloo, that stomach, "which dies, but never surrenders," withstood the onslaught of bird after bird, until finally, after the thirtieth quail, its heroic owner quaffed off a goblet of wine, and announced that for the last ten meals he had enjoyed his repast. After this, these columns will be rigidly closed to any further stories about the impossibility of eating quails.

Patent Proceedings in Congress.

The following is an abstract of patent measures brought before Congress, up to the period of the going to press of this issue:

HOUSE OF REPRESENTATIVES.

Mr. Dobbins, of New Jersey, January 11, presented the petition of A. B. Wilson for extension of his patent on sewing machines. Referred to Committee on Patents.

Mr. Hartzell, of Illinois, January 12, introduced a bill to amend section 4,898 of Revised Statutes relating to patents. This bill was reported from the Committee on January 26, with the recommendation that it pass. It was accordingly read a third time, and passed. Mr. Hartzell also introduced, on January 18, a bill relating to sections 4 910 and 4,916. Referred to Committee on Patents, and ordered to be printed.

Mr. Foster, of Ohio, January 18, introduced a bill authorizing extension of Horace Woodman's patent for a card-stripping machine. Same disposition as preceding bill.

Mr. Hoar, of Massachusetts, January 14, offered petition of Samuel A. Knox for extension of his patent on plows. Referred to Committee on Patents.

Mr. Vance, of North Carolina, January 13, reported a resolution "that the chairman of the Committee on Patents, and the acting chairman of any sub-committee thereof, be authorized and empowered to administer oaths when deemed by them necessary in any and all investigations before them." Adopted.

Mr. Seelye, of Massachusetts, January 24, offered a petition for the renewal of Thomas A. Weston's patent. Referred to Committee on Patents.

Mr. Whitehouse, of New York, January 24, introduced a bill for extending Reynolds' patent for brake for power looms. Same disposition as the preceding.

Mr. Warren, of Massachusetts, January 24, presented a bill relative to copyrighting patterns for castings. Referred to Committee on Manufactures.

Mr. Caldwell, of Alabama, January 24, introduced a bill to enable Charles A. Fondé to make application to the Commissioner of Patents, for the extension of his letters patent for a dredging machine. Referred to Committee on Patents.

The bills amending sections 4,898, 4,910, and 4916 of the Revised Statutes, referred to in our abstract, are designed to give to the assignment of patents and interests in patents the same solemnity and formality that attach to conveyances of real estate. They authorize officers commissioned to take acknowledgments of deeds to take acknowledgments of assignments of patents, which assignments are of effect from date of record in the Patent Office.

Mr. Douglas, of Virginia, on January 26, reported from the Committee on Patents a bill which is aimed at a custom, said to be prevalent among clerks at the Patent Office, of searching the records and procuring information for claimants at a distance. The bill makes the acceptance of money or any valuable thing, other than his salary, by any officer, clerk, or employee of the Patent Office, for work pertaining to the Patent Office, a misdemeanor punishable by fine and imprisonment. It extends to the Patent Office the provisions of section 190 of the Revised Statutes, which declares that no officer, clerk, or employee in any department or bureau of the government should act as counsel, attorney, or agent in prosecuting any claim pending in his bureau or department while in the government service. It also forbids his acting in such capacity within two years after leaving the public employment.

SENATE.

Senator Hamlin, of Maine, January 13, intreduced a bill of the same tenor as that of Mr. Foster, of Ohio, in the House, above noted. Referred to Committee on Patents, and ordered to be printed.

Senator Logan, of Illinois, January 21, presented the petition of W. H. Akins and Jacob D. Felthouser, praying compensation for inventing new and useful improvements in sewing machines. Referred to the Committee on Patents.

Senator Eaton, of Connecticut, January 21, introduced a bill of same tenor as that of Mr. Seelye of Massachusetts in the House, above noted. Referred to Committee on Patents, and ordered to be printed.

Artificial Vanillin.

The details of Haarmann and Tiemann's process (mentioned on page 37 of our volume XXXI) for the manufacture of vanillin, are given as follows in the *Deutsche Industrie Zeitung:* Dissolve 10 parts of coniferin in hot water. Conduct this concentrated solution in a fine steam into a moderately warm mixture of 10 parts bichromate of potash, 15 parts sulphuric acid, and 80 parts water; then heat to boiling for three hours. The vanillin formed is either extracted by ether, or isolated by distilling in steam.

The Supposed New Cereal.

M. B. says: "In a recent issue of your paper I see an article concerning a new grain found in the crop of a wild goose. I discovered this identical grain in 1850, where civilized man had never before trod the soil; it was growing as an aboriginal product, in a gulch in the Utah Mountains. The location is northwest of Salt Lake. The grain was ripe, and resembled rye more than any other distinct type."

Incombustible Wood.

The invention of Mr. A. F. Richard, of Dax, France, relates to the preservation and incombustibility of wood by the aid of crystallized chloride of sodium in solution in water at between 6° and 24° by Baumé's aerometer, and of a solution of chloride of sodium and alum at between 4° and 27°, either mixed in variable proportions or employed separately.

What the Preacher Said.

A lady, residing at Joliet, Ill., writes to a friend in this city that, at church, the other day, the minister said that one very sure way of discriminating, between a good young man and one of frivolous habits, was by watching them as they went to the news stand for a paper. When a youth was seen to select the SCIENTIFIC AMERICAN instead of a daily or an illustrated story paper, the observer might feel pretty confident of that young man's future.

Business of the Canadian Patent Office.

According to the Canadian Patent Office *Record* for December, 1875, there were issued in Canada, from October 20 to November 24, 1875, inclusive, 127 patents, of which 81 were granted to citizens of the United States, 39 to Canadians, 6 to subjects of Great Britain, and 1 to a citizen of France. It will be understood from the above that nearly two thirds of all the fees paid to the Canadian Patent Office are furnished by American inventors.

The Conviction of L. W. Pond.

Mr. L. W. Pond, the once well known machine tool builder of Worcester, Mass., was captured some time ago in San Francisco, Cal., and brought back to Worcester for trial for the forgeries he had committed. Some thirty-two indictments were found against him; but on being arraigned, he plead guilty to three. Without considering the other charges, the court sentenced him to fifteen years in the State prison.

Passage of the Centennial Appropriation Bill.

The bill appropriating $1,500,000 for the purposes of the Centennial Exhibition has passed the House of Representatives by the close vote of 146 to 130. A few amendments were added, mainly with reference to the filing of bonds by those accountable for disbursements, and for regulating the payment of the sum from the Treasury.

Useful Recipes for the Shop, the Household, and the Farm.

To make cider: Take good sound apples (the sweeter the apples, the sweeter the cider) late in the fall, the later the better before the first frost. Early apples and windfalls may do for vinegar, but will not make cider that will keep for any length of time. Fill the barrel full, put in the cellar, take out the plug, and let the cider foam out for about ten days, keeping the barrel full with cider made at the same time. After the cider has worked about ten days, take a long slim bag that, when filled, will go in at the bung hole, put in about 1 lb. of English mustard for every 50 gallons, and drop into the cider; then cork the barrel airtight, and let it stand about three weeks, then draw off into another barrel.

A precaution relative to the care of carriages, which is often overlooked, is to prevent rust of the spring plates where they are joined together and not covered with paint. The joints should be lubricated; and the best material for this purpose, where dark colors are used in painting, is composed of 2 parts each of pure beef and mutton tallow to 1 part blacklead, well mixed, applied warm and in small quantities. When light colors are used in painting, diminish the quantity of graphite.

It is said that leather may be affixed to metal, so that it will split before it can be torn off, by means of the following composition: A quantity of nut galls reduced to powder is dissolved in 8 parts of distilled water, and after remaining for 6 hours is filtered through a cloth. This decoction is to be applied to the leather. Then take a similar quantity of water and add to it 1 part (by weight) of glue, which is to be held in solution for 24 hours, and then applied to the metals, which should first be roughened and heated. The leather is then laid upon the metal and dried under pressure.