

SOMETHING NEW IN WOOD-WORKING MACHINERY.

The increasing demand for greater production of ripping material without increase in driving power and waste in saw-kerf has resulted in the introduction of the new self-feed band ripping saw illustrated herewith—a machine that cannot fail to interest those who are engaged in the reduction of lumber to exact parallel widths for flooring, ceiling, siding, etc.

This machine rips material to a width of 24 inches and a thickness of 10 inches; carries a saw blade 3 inches wide and is regularly provided with three speeds of feed, viz., 50, 100 and 150 feet per minute.

The frame has a straight upright column to support the crosshead for the feeding mechanism and the upper wheel. The crosshead is gibbed to the column, is vertically adjustable for variations in length and proper tension of the blade and is operated by the ratchet lever.

The wheels are 42 inches in diameter and are mounted on steel shafts. The top shaft is 1½ inches and the lower shaft 2¼ inches in diameter, both running in long, self-lubricating bearings, which are adjustable for purposes of alignment and for the purpose of properly tracking the saw blade.

The top wheel is quickly adjusted, is balanced on a knife edge and can adjust itself to favor the blade.

The table is made of iron, the dimensions being 3 feet 6 inches by 3 feet 8 inches and is provided with a quickly adjustable fence that admits ripping up to 24 inches in width. Small rolls in the table reduce the friction of the material.

The feeding mechanism consists of two feeding disks, one receiving and the other delivering the material, both being mounted in suitable bearings, supported on a heavy slide gibbed to the crosshead which carries the upper wheel.

This mechanism is controlled by the long lever shown, so as to ease up when there is too great a variation in the material, or to lift the feed instantly from the stock. The delivering disk is independently weighted and can be lifted out of the way when not in use. In conjunction with this feeding device, the upper frictionless wheel-guide for receiving the back thrust of the saw and relieving it of friction is used. The guide is also provided with side plates for retaining the blade in a vertical line, and, since it is operated in connection with the feed, it is raised or lowered with the latter, always retaining its relative position.

The guide, however, can be independently adjusted vertically. This is of advantage when it becomes necessary to lift the feed rolls to use the machine as an ordinary band, scroll or rip saw. The guide, moreover, can be lowered 5 inches below the rolls.

The changes in the speed of the feed are accomplished by means of cone pulleys provided with a belt tightener under the control of the operator.

The designers and manufacturers of this machine are the Egan Company, 327 to 347 West Front Street, Cincinnati, Ohio.

In proportion to its size, a fly walks thirteen times as fast as a man can run.

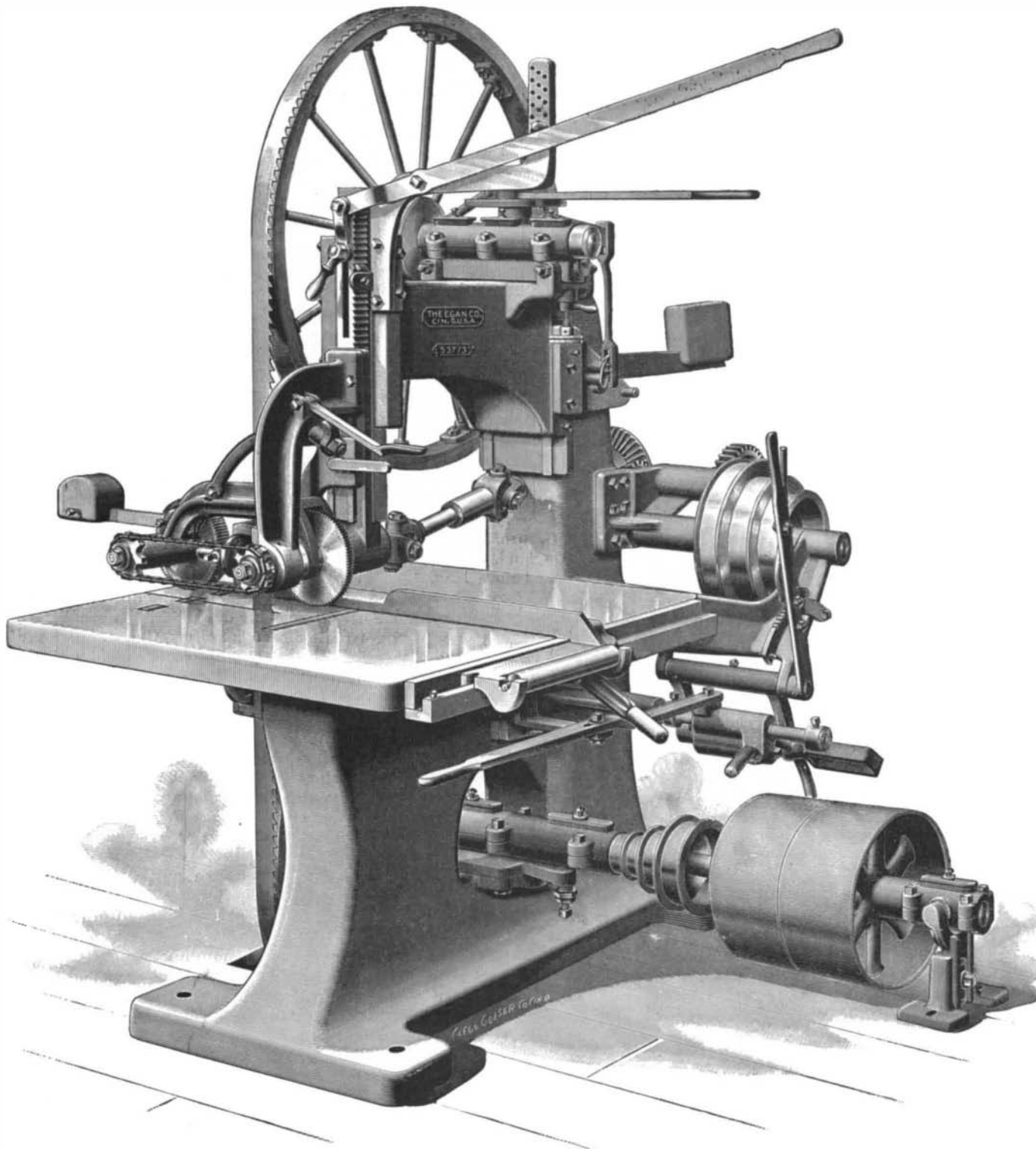
The Deterioration of Paper.

The subject of the lasting qualities of paper is a most important one, as upon it depends very largely the permanence of our literature. It is a curious fact that nearly every large library which circulates books is obliged from time to time to throw away books which are really worn out. If we compare these books with old theological works from a monastic library, which very nearly approximates the conditions of the circulating library, we find that the old hand-made paper has stood not only the effect of time, but usage as well, much better than the modern papers.

The report of the committee appointed by the Society of Arts to consider the causes of the deterioration of paper is printed in a late number of the society's Journal, and is here summarized. At the outset, the report points out that during the present century the paper-making industry has undergone many revolutionary changes. As an industry it has grown considerably, and to meet the requirements of the enormously

exhibiting various grades of deterioration of the paper of which they are composed. They conclude on the evidence before them as follows: As to the two tendencies to deterioration of papers, these are marked (1) by disintegration, (2) by discoloration. They are independent effects, but may be concurrent. They are notably so in papers containing mechanical wood pulp. Actual disintegration has been brought to light in papers of all grades; from those of the best quality as regards the fibrous materials of which they are composed, i. e., rag papers; also, of course, in those of lowest quality, i. e., containing mechanical wood pulp in large proportions. It is generally the result of chemical change of the fibers themselves. As to the causes determining such changes: In the case of the rag papers examined the effects appear to be due to acid bodies; the disintegration may be generally referred to acidity. In the case of mechanical wood pulp, the effects are traceable to oxidation pure and simple; the disintegration is accompanied by a basic or alkaline reaction of

the paper. Discoloration may be said also to affect all papers more or less, and without discussing minutely the chemistry of the changes, the evidence obtained certainly warrants the general conclusion that discoloration of ordinary cellulose papers (as distinguished from those containing mechanical wood pulp) under usual conditions of storage is proportional to the amount of resin which they contain, or more generally to the resin and the conditions employed for fixing it in the ordinary process of engine-sizing. The committee have been desirous of bringing their investigations to a practical conclusion in specific terms, viz., by the suggestion of standards of quality. They limit their specific findings to the following: viz., (1) normal standard of quality for book papers required for publications of permanent value. For such papers they specify as follows: Fibers.—Not less than 70 per cent of fibers of the cotton, flax, and hemp class. Sizing.—Not more than 2 per cent resin, and finished with the normal



THE NEW SELF-FEED BAND RIPPING SAW.

increased production a quantity of new fibrous raw materials have been introduced and have taken their place in due course as indispensable staples. The more important of these, so far as concerns this country, are esparto, in the period 1860-70; "mechanical wood" or ground wood pulp, in 1870-80; the wood celluloses, in the period 1880-90. These substances differ in chemical composition from the celluloses obtained from cotton, flax and hemp, which were the exclusive staple raw materials for paper making up to this century; and although they are efficient substitutes in most respects, it must be admitted that time has not yet been able to pronounce a judgment upon the relative permanence of the papers made from them. There is more than a suspicion that many of them are very inferior in this important respect, and it has been the main purpose of the work of the committee to sift the evidence upon which suspicions have been engendered.

The committee referred to above have examined a number of books as evidence of "deterioration of paper;" some submitted by librarians in a condition of complete disintegration; some of their own selection

acidity of pure alum. Loading.—Not more than 10 per cent total mineral matter (ash).

A New Way of Preserving Meat.

A new method of preserving freshly killed meat has been discovered by a Danish zoologist, August Fjelstrup, who is the discoverer of condensing milk without the use of sugar. The system has been used in a Danish slaughter house for three months. The animal is first shot or stunned by a shot from a revolver in such a way as not to injure the brain proper. When the animal drops down senseless, an assistant cuts down over the heart and opens a ventricle, which allows the blood to flow out, the theory of this being that the decomposition of the blood is almost entirely responsible for the quick putrefaction of fresh meats. Immediately after the blood is let out, a briny solution, which varies in strength according to the time the meat is to be kept, is injected by means of a powerful syringe through the other ventricle into the veins of the body. The whole process takes only a few minutes and the beef is ready for use and can be cut up at once.

Science Notes.

Prince Luigi of Savoy, Duke of the Abruzzi, recently took a balloon trip from Turin, accompanied by his personal adjutant, Lieut. Cagrie, and the French aeronaut Godard. The day was squally, so that the duke, after being driven far enough south to see the Riviera, as far as Vintimiglia and Monaco, and then northwest to Mont Cenis, was at last landed, at the end of five hours, near his starting point, Turin. The highest altitude reached was 6,000 feet. Naval Lieut. Cagrie's post is no sinecure. He has been obliged to accompany the prince to the top of Mount St. Elias, will be in his Arctic expedition next year, and on this balloon trip was dropped as superfluous ballast at the point furthest from Turin reached by the balloon.

Artists in photography will be interested in a statement made in *The Engineer*, London, that Arthur W. Clayden, fellow of the Royal Meteorological Society and head of the college at Exeter, exhibited in a recent lecture on photographing meteorological phenomena some lantern-slide views of clouds taken by him after a process recently invented by him—photographs showing beautiful blues in all their shades, from ultramarine down to perfect white, various grays and some iron-red and greenish tints. The revolutionizing feature of the Clayden process consists in the fact that these colored photographs are positives; that is, according to the statement given out, he has succeeded in obtaining colored prints by a purely chemical way of developing the same on a specially prepared plate. The process at present is restricted to lantern slides, but these are not colored by painting but by development, while colored paper prints loom up distinctly in the near future. Bright red rays, the inventor says, have so far escaped him, but he believes that further experiments and probably a longer development will realize the mastery of that defect. As an intermediary stage between plate prints and paper printing, ivory or thin celluloid plates have been suggested.

In *The Monthly Weather Review* for February an interesting account is given of the value of a searchlight for making weather signals known in large cities or seaports at an hour of the evening when it is too late to give warning by the usual method. In the month of February, 1895, the searchlight for the unfortunate battleship "Maine," then nearing completion, was lent for temporary use at the Chicago office of the Weather Bureau, and the experiments were conducted by the present chief of the latter institution. From observers and other persons it was ascertained that the signals were clearly seen at a distance of twenty miles. At present the great cost of maintaining the apparatus in operation would preclude its adoption, but in the event of the expense being eventually reduced, the author thinks it might be used by the Weather Bureau for the purpose of immediately disseminating forecasts made from the evening observations.

At a recent meeting of the Paris Academy of Medicine, M. Grancher read a report on tuberculosis, in which it is recommended again (confirming resolutions arrived at in 1890) that all sputum should be collected in vessels containing a solution of carbolic acid, or else water; that sweeping should be avoided as much as possible, dust, etc., being removed or wiped off with a damp cloth, and that all milk should be boiled before it is consumed. With reference to family practice, the Academy recommends to all medical men the continued application of these prophylactic measures from the time when tuberculosis is diagnosed, and also, if possible, to keep the disease quiescent by means of an early diagnosis and proper treatment. With regard to the army, the Academy suggests that early cases of tuberculosis, in which the expectoration does not contain bacilli, should be invalidated temporarily, and permanently as soon as sputa are found to contain Koch's bacilli. The Academy makes an appeal for the earnest co-operation of the military and hygienic authorities to see that the recommendations are carried out in every barrack.

M. P. Villard, in *The Comptes Rendus* of May 16, describes a peculiar effect he has noticed when experimenting with fluorescent screens of barium platino-cyanide. If an obstacle, as, for example, a sheet of glass or metal, is interposed for a few minutes between the screen and the source of rays, and then removed, he found that the part which had been in shadow exhibited a stronger fluorescence than the remainder of the screen. He also found that the parts of the screen which had been exposed to the stronger action of the rays became slightly brown, as compared with the protected part, as if a chemical action had modified the fluorescent salt. This impression on the screen remains until it has been exposed to light for some time. The same effect is observable with platino-cyanide of potassium, and takes place equally, whether the salt has been simply placed on a sheet of glass or varnish has been used to fix it. It appears from these results that it is not advisable to keep fluorescent screens inclosed in boxes in the form of stereoscopes as is usually done, but that they should, on the contrary, be exposed to daylight when not in use.

How to Make a Genealogical Search.

Mr. Edwin Stanley Welles has written an interesting account in *The Independent* upon how to make a search for ancestors. Within the past few years there has been developed a remarkable interest in the pursuit of genealogical investigation. Step into any historical library and you will see men, and still more women, trying to hunt up their ancestors among the various historical and genealogical books. It is a fascinating study, and grows more fascinating as the investigator proceeds; but it is beset with subtle difficulties, which at times dishearten the most courageous seeker. If one enters upon a search, he must expect to find his trail suddenly disappear; and he will be compelled to put forth his best efforts to discover its onward course. It may be, however, some consolation for him to know that a clear, easy search is most unusual.

The majority of those who want to know about their ancestors—who they were, where they lived, and whether any of them served in the colonial or revolutionary wars—have only the vaguest ideas of the way in which to proceed. "The trouble," said one of our librarians, "with the women who attempt to trace up their ancestors is, that they do not know how to make an investigation." This remark, it is needless to say, is quite as applicable to the men who undertake a search without some previous training.

Now let us watch a genealogical expert as he conducts an investigation. He starts, let us say, with the following data: that Mr. Brown's grandfather Jonathan Brown lived in Coventry, Conn., as late as 1800, when he removed to Western New York, where he died some twenty years afterward, at the age of 76. He had married and his children were all born before his change of residence; but the maiden name of his wife, the time of their marriage and the dates of their children's births are not known. The grandson [has] found the trail clear up to 1800, but back of that he is wholly in the dark.

What will the genealogist do with these data? First of all, he will ascertain whether the grandson has properly searched the printed books that may contain the requisite information. The chances are that he has not; so the genealogist will begin by consulting at least these three standard genealogical works, which are to be found in every well equipped historical library: 1, "Savage's Genealogical Dictionary of the First Settlers of New England, showing Three Generations of those who came before May, 1692" (4 vols.); 2, "The New England Historical and Genealogical Register" (49 vols.); 3, Hinman's "Puritan Settlers of Connecticut" (1 vol.). These three works, together with the "Essex Institute Historical Collections" (33 vols.), are well-nigh indispensable to the student of early New England genealogies.

Of course, the genealogist will notice whether there is a "Brown genealogy," and such being the case, whether it treats of his particular Mr. Brown of Coventry; he will also ascertain whether there is a history of the town of Coventry, and if there is one, whether it contains the genealogies of the old families there. But suppose all these sources fail to give any light? Possibly Mr. Brown's ancestors were too obscure to be mentioned, or no one has ever traced them out; and, generally speaking, the facts most essential to obtain are not to be found among the printed records.

In Connecticut, however, there is one important exception—the names of those who served in the Revolutionary War and in the War of 1812 have been printed by the State, although these lists are, unfortunately, somewhat incomplete. Having exhausted the printed works that might bear on this case, the genealogist now turns to the most fruitful sources of information, which may be termed "the manuscript records." There are at least four sets of these records, which he will closely and carefully examine before he will be willing to make a report. These are: 1, The Land Records of the Town; 2, The Town Records of Births, Marriages and Deaths; 3, The Church Records of Baptisms, Marriages and Deaths; 4, The Probate Records.

A few words of explanation should be given about these different records. In the first place, then, it is not safe to trust the indexes of the early Land Records. In some instances they may be accurate, but, ordinarily, they have been carelessly made. Over and over again, they have failed to reveal important facts hid away in their musty tomes. We must "wade" through them, if we wish to be sure of our results. And as so much utterly untrustworthy work has been produced by simply glancing through the indexes, one should not rest contented until he has patiently gone through those formidable volumes page by page. The Town Records of births, marriages and deaths are sadly fragmentary as a rule, and each name should be deciphered, without depending upon the index. Sometimes such lists are to be found scattered among the volumes of Land Records.

In most of the old New England towns there are early Church Records of baptisms, marriages and deaths which frequently supplement the correspond-

ing town records. They are usually kept with the clerk of the church or the minister of the parish. Anciently the minister made the entries, and their fullness and accuracy depend upon his faithfulness in entering each record. Occasionally, when an examination of all these records fails to disclose a much coveted fact, like the age of a child or the maiden name of the widow, the Probate Records will yield the information. The wills, inventories and distributions contain a vast amount of curious and valuable information.

When the genealogist has completed a thorough examination of these four sets of records, it will be strange if he does not make some important discoveries. In our supposed case of Jonathan Brown, the Land Records of Coventry will show whether he owned property in that town, and, if so, when he bought it and when he sold it. Perhaps the will of his father, if found at the Probate Office, will disclose the fact that he inherited it, and his marriage will probably appear either on the church or town records. And so, step by step, the line is followed back, and generally several towns have to be visited.

Possibly the genealogist will be obliged to scan the headstones in some old churchyard to supply a missing date. In Connecticut, if a record of service in the colonial wars is desired, he will have to examine the manuscript muster and pay rolls in the State Library at the capitol, Hartford, and in carrying his search still further back he will be likely to consult the early Court Records. But enough has now been given to show the seeker after genealogical information how to go to work. If he cannot undertake a personal investigation or feels incompetent to do it, his wisest course is to select an experienced genealogist familiar with every branch of genealogical work. Learn his prices in advance, send him all the data, and he will be able to trace the family line if any existing records bear the impression of its course. He cannot do impossible things, for he cannot ascertain facts when the facts are wanting in the records; but he can often disentangle a very perplexing genealogical snarl. And, finally, be it observed, that it is only by much patient and persistent delving that real genealogical treasures are unearthed.

The Metric System as Applied to Textile Manufactures.

The uniform numbering of textile fabrics is of great importance to the textile manufacturers of the world. At present many different rules are in use, all of them being dissimilar. In France, which is the cradle of the metric system, the numbering "kilometrique" is used only for cotton thread and "bourne de soie." This unit is based upon the relations between the weight in demikilogrammes and the length in kilometers. There is great confusion in the international numbering; in fact, few people can distinguish, in the many complicated modes of numbering, the exact numbering of thread intended. Uniformity in this matter would greatly simplify the technique of the textile industry, but to accomplish this result it is necessary to establish an invariable rule, which can only be done by the co-operation of manufacturers. This question has for a long time occupied the attention of those interested in the industry. It was the subject of investigation at five successive congresses: Vienna, 1873; Brussels, 1874; Turin, 1875; and Paris, 1878 and 1889. The subject will be brought up again at the International Exposition to be held at Paris in 1900. At all the former metric congresses, while progress has been made, no practical results have been obtained. This has resulted from the fact that the metric system has not yet been adopted by all countries and uniformity has not become general, even in France. Both England and the United States place goods in foreign markets that are not numbered and manufactured according to the metric system, but as this country is now making strenuous efforts to compete with other nations with foreign trade in merchandise, it would seem that our textile manufacturers would do well to be represented at the congress at Paris in 1900. It is, of course, well to employ the system of weights and measures to which foreign buyers and consumers are accustomed. Failure to do this has lost Great Britain a portion of her trade, and it also prevents the United States from having as much trade as she would otherwise have.

It is well known that milk is more or less altered in taste and color by sterilization. Dr. A. Wroblewski finds from the results of his experiments to ascertain the effect of sterilization on the chief constituents of milk, such as milk sugar, albumen and casein, that milk is so far altered by sterilization that the milk sugar is partly caramelized—a very small amount of lactic acid being also formed—the albumen is coagulated, and the casein partly precipitated, or at least brought into such a condition that it can be readily precipitated by acids. Pasteurization acts in a similar manner, but to a less extent. It is concluded, however, from a chemical point of view, that milk is not rendered less favorable to digestion by being sterilized.—*Oesterr. Chem. Zeit.*, i, 5.