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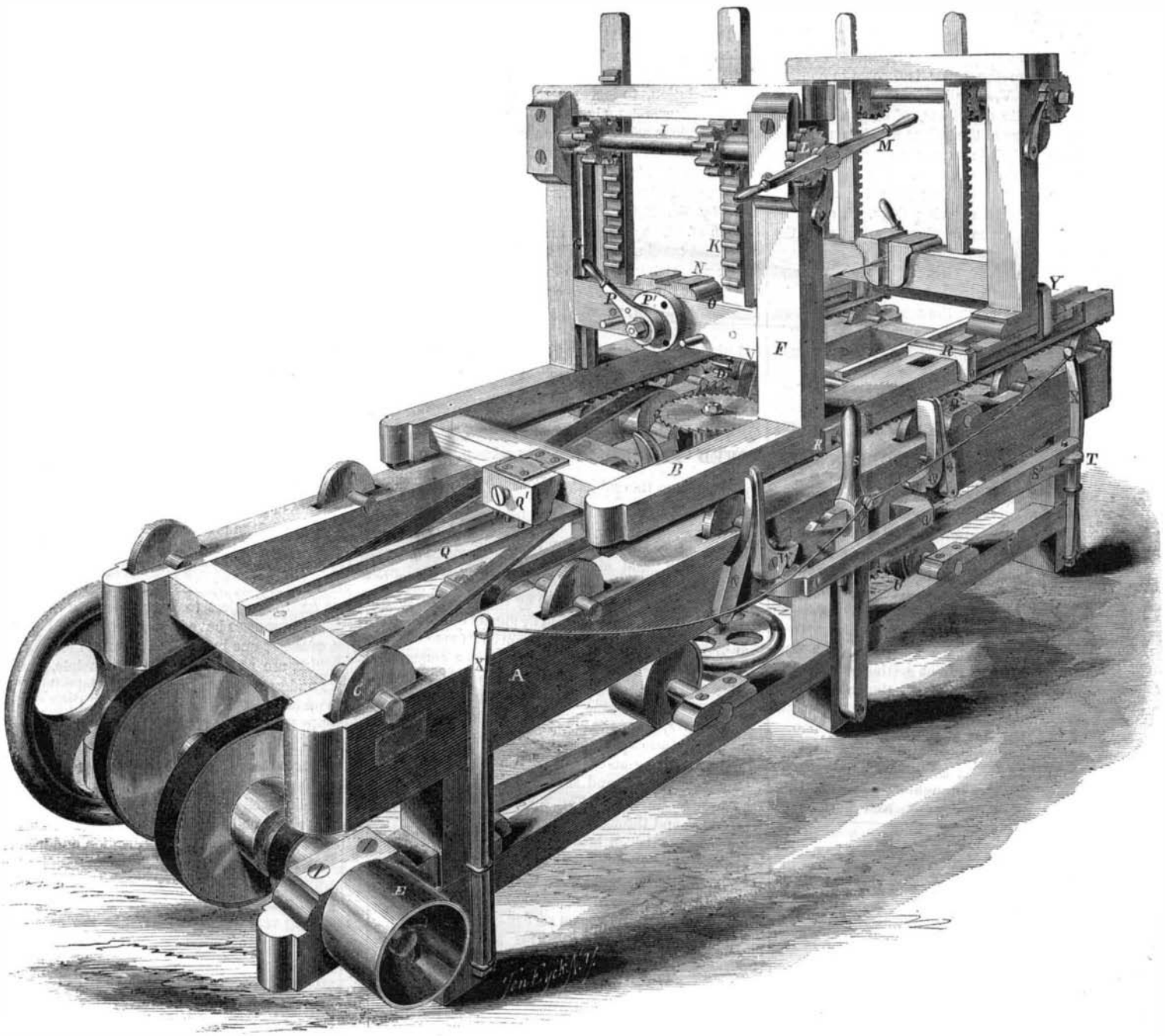
Improved Sawing Machine.

It has often occurred to us that if the idea were feasible, it would be an excellent plan to reproduce, with the thousand-and-one inventions that are constantly passing through our hands, the rude and clumsy machines that were employed years ago in their stead. In so doing, the merits of the new machines would be strongly contrasted with the inefficiency of the old-time processes, and the most casual observer or sceptical individual could not fail to be impressed with the value of "the latest improvement." As such a course is obviously impossible, it only remains for us to faithfully delineate and describe the inspirations of modern inventors, and leave the useless tools to molder in the dust and gloom in which their demerits are properly concealed.

Our artists have here given a very accurate and beautiful engraving of Bowers's improved Sawing Machine, by the aid of which strips of wood for hay, fork, broom, and hoe handles, for curtain rollers, or indeed any purpose where straight and true wooden batons are required, are produced direct from the log, without the round-about and unnecessary process of sawing the timber into planks at first.



BOWERS'S SAWING MACHINE.

The plan of the machine is as follows :—

The strong wooden frame, A, carries another frame, B, which is mounted on rollers C, and has a rack for a portion of its length on the under side, into which a pinion, D, gears. This rack and pinion, as well as all the other machinery, is driven by a belt running on the main pulley, E; from the shaft to which it is keyed, various belts run to counter shafts in the body of the machine, thus driving the several parts. The cutters consist of two circular saws, one running vertically and the other horizontally; they may be seen near the center between the frames. Upon the frame, B, there are two upright timbers, F, which are strongly fastened thereto, and these timbers have slides, G, on the inside, on which the cross beams work. There is also a transverse shaft, I, on these timbers, which carries a pinion, J, on each end, said pinions gearing into racks, K, secured to the cross beam; there is a ratchet wheel and pawl, L, on the end of this shaft, which, in connection with the two-handed lever, M, retains the rack and beam at any desired hight. On the cross beams there are sliding carriages, N, which have racks on the under side, at, O, which mesh into pinions set in a mortise in each beam.

These pinions are worked by the lever, P; there is a pin in each lever, and also a perforated plate, P′, in which the pin fits. These are the principal details; the operation is as follows:—

The log to be worked up into stripes is previously cut of the right length and suspended between the two frames, as shown by the arrow; it is removed in the engraving, as it would hide important parts of the machine. The entire frame, B, and all its fixtures runs on the friction rollers, C, said motion being given by the rack and pinion, D; of course this carries the log up to the saws, which are supposed to be rapidly revolving; they each take a cut, one horizontally and the other vertically, which, in meeting, separate a strip from the log. This strip falls on to the ways, Q, where the hinged pawl, Q′, seizes it, and, as the carriage continues to advance, pushes it off clear of the gearing below; for this pawl is so arranged that it lifts up when the carriage runs back, but engages with a strip through the agency of the teeth on its under side when the carriage advances.

The back-and-forth motion of the carriage, B, is obtained by the dog, R, and lever, S. The lever connects with a horizontal bar, S′, which in turn works an arm, T, carrying slides and rollers inside of the frame. These rollers press against the belts, U and V, which drives the carriage one way, and on the return of the carriage the roller is thrown in contact with another belt, V, also inside the frame; these belts run in opposite directions, of course, and by the alternate pressure of the rollers which work "fast and loose" on each belt in turn, the carriage and log is moved up to and from the saw. The lever, S, has two catches on a bar projecting from the side, and these catches engage with spring dogs, W, and hold the roller inside the frame in close contact with the belt, making it hug the pulley tightly; as the carriage is run along, the stop, R, strikes the dog, W, and throws the roller clear of the belt, thus leaving the carriage free to return when the other roller is thrown against the other belt. By the stop, W, the lever is always returned to a vertical position by the action of the springs and cords, X.

The carriage can be set at any point to accommodate logs of any length, by unscrewing a bolt in the heads of the clamps, Y, and sliding the uprights along to the desired point, and the log is adjusted after strips have been cut from it all around, by lowering the centers, N, with the rack and lever. The operation thus goes on until the work is completed.

The various parts of this machine are arranged most ingeniously to attain the desired end. It does not appear to be a combination of half a dozen different inventions, but the inventor seems to have started with a purely original idea, and has carried out the same in a practical manner.

This machine was patented by Isaac W. Bowers, Ovid Center, Mich., August 25, 1863, through the Scientific American Patent Agency. For further information address the inventor at that place.

PHOTOGRAPHY IN THE PAST YEAR.

[From the London *Photographic News.*]

The past year has been in many respects a successful one for photography. Commercially its applications have been extending, and its professors have been generally prosperous. The art itself has been progressing and expanding. Well understood processes have been acquiring greater stability and excellence. Some new principles in the other processes have received recognition, and specific improvement has been made. General activity, increased scope and usefulness, and steady improvement, are amongst the facts to be recorded in this year's chronicle of the art.

Perhaps dry-plate photography presents some of the most noteworthy modifications. The value of certain alkaline conditions, which, at the commencement of the year was beginning to obtain hesitating recognition, is now an accepted fact of great importance. The idea seems to have been of such uncertain and gradual growth, that it is difficult to trace it to its origin. Although Mr. Bartholomew's alkaline gelatine process appears to contain one of the earliest distinct indications of the value of alkaline conditions, nothing further of a very definite kind seemed to proceed from it. The starting point of fresh experiment appears to have been the American practice of fuming the tannin plates before exposure. From this, Mr. Leahy and Major Russell, each independently, arrived at alkaline development. The latter gentleman had added to the claims he has upon photographers, by the assiduity with which he has worked during the year, to secure certainty in the application of this and other principles to dry-plate photography. The use of a simply bromized collodion, proposed ten years ago for the wet process, and but little used, is now likely to come largely into use in the wet process. In the year 1853, we find J. F. W. Herschell remarking, when speaking of the hard black and white effects of iodized collodion, that "iodine must be thrown over board or limited in its use *coute qui coute*, if photography shall ever satisfy the desires of the artists," and he then adds: "A new photography has to be created, of which bromine is the basis." It is possible, in dry photography at least, that this remark may still become true. It is a somewhat singular fact as bromine played such an important part in the first, most successful and beautiful dry process—that on silver plates—that its value in other dry plates should have been so tardily discovered or acknowledged. We have not heard much of hot development for tannin recently; but some of the charming instantaneous pictures sent by Col. Stuart Wortley, at the last year's Photographic Exhibition, were produced on tannin plates, and with the aid, we understand, of hot development. The addition of various substances to the tannin solution, to increase the sensitiveness of the plate, has been largely discussed; but the utility of such additions still remains an open question. The idea enunciated by Mr. Bartholomew, and further worked out by Mr. Hannaford, of adding silver to the albumen solution in Fothergill plates, has been revived by Mr. Fothergill, and the results are highly spoken of. The new principle discovered by M. Poitevin, that tannin, and similar oxidizable substances, act as sensitizing agents to insensitive iodide of silver, and supply the place of free nitrate of silver, is most important, and may probably be of great value in reducing to definite form the many vague ideas at present prevailing on dry-plate photography.

Printing processes have occupied considerable attention during the year. The introduction of enameled papers for securing a surface registering perfectly all the detail in the finest negative, was at first hailed by many photographers as a boon. When the sample of paper was good, the prints were certainly very delicate, and in many respects beautiful; but the uncertainty of the results, arising chiefly out of the imperfect preparation of much of the paper and some other causes, have tended to give the enameled papers a short-lived popularity, and they are now, we believe, rarely used. From the same cause, imperfect preparation, a paper which promised many advantages, for large pictures, in its freedom from gloss, and yielding fine vigorous prints, introduced under the name of amorphous albumenized paper, has been condemned as unsatisfactory. Gold toning processes have again been under examination, and amongst many photographers a decision in favor of the bath containing chloride of lime has been given, on the ground that it is simple, economical and satisfactory in use. Fixing processes have been reconsidered, and M. Meynier's proposal to supersede the troublesome and readily decomposed salt now used, hyposulphite of soda, by the more stable sulphocyanide of ammonium, has excited much attention, but the latter salt has not yet come into any extended use. One of the earliest objections made, the high price of the salt, has disappeared, as M. Meynier is now enabled to manufacture it at about one shilling and three halfpence per pound. One of the chief theoretical objections to its use arises out of the fact that the double sulphocyanide of ammonium and silver, formed in the process of fixing, is decomposed by the addition of water into sulphocyanide of ammonium and sulphocyanide of silver; the latter salt not being soluble in water, some traces of it are probably left in the print. This is, however, a point which will probably be decided better by practical experience than theory. We have prints in our possession, fixed with sulphocyanide of ammonium, and some fixed with sulphocyanide of potassium, eight months ago, perfectly free from all signs of fading or decomposition. This fact furnishes an argument in favor of sulphocyanides as fixing agents. Their stability, and the little danger which exists in their use of the liberation of any sulphuretting agent, and several other arguments, are strongly in favor of giving them a fairer trial than they have yet received. We hope, during the coming year, the subject will receive all the attention it deserves.

In connection with printing, the subject of weak silver baths has excited considerable attention. For some years past, until recently, a strong feeling has prevailed in favor of strong printing baths. A variety of good arguments in their favor exist, and it has been rightly held that they give greater certainty of good results than weak baths. An inquiry has been made during the year as to whether this certainty might not be obtained with a less expenditure of silver, and in many practical hands an answer seems to have been obtained that it might. We now find many extensive practical printers using thirty or forty grain baths, who, until recently, used seventy or eighty grain baths, and as they declare with equally good results. We here simply note the fact without entering into the general argument, which is too wide a subject for treatment in a glance at the year. The same remark is true of the proposed addition of nitrate of soda to the printing bath, and of Mr. Anthony's proposed bath of oxide of silver, dissolved in a solution of nitrate of ammonia. They are subjects which demand more full and careful consideration.

Carbon printing processes have made some progress, especially in the printing-ink process of M. Pouncy. In this process we have well marked gradation and half-tone in photographs obtained direct from the negative, the image being composed of printing ink. This in itself is a startling and important fact. That improvements in detail are desirable, in order to secure pleasing and artistic prints, is doubtless true; but it is equally true that these improvements are in progress, that there is much to hope for from the process. M. Poitevin's new principle in carbon printing is also important. Instead of rendering a soluble substance insoluble by light, he works in the contrary direction. Carbon being mixed with gelatine is spread upon paper, is then rendered insoluble by the action of perchloride of iron and tartaric acid. The action of light upon such a film is to render it insoluble, and when exposed under a transparent positive, the lights are rendered soluble in water, and the half-tones become soluble in just such proportion as they have been acted upon by light. In this process M. Poitevin sees a better mode of obtaining half-tone than by the reverse method before adopted.

In photo-engraving the process of Mr. Dallas is the great fact of the year. The present number contains a specimen of the process and some remarks thereon. Photo-lithography has progressed rather in the extent of its application than in any special point of practice. Mr. Lewis has contributed some valuable hints on the subject to our pages. In France, two or three processes have been invented and patented. Two of these, one by M. Morvan, and the other by M. Marquier, are nearly identical in principle, and so far as we understand them, in no essential point different to the method of Messrs. Cutting and Bradford, patented in this country several years ago. Mr. Osborne is in Berlin experimenting for the improvement of his own process, and some of the specimens we have received from him are as delicate and perfect as subjects in line well can be.

In the wet collodion process there has been very little change; bromo-iodized collodion and iron development are almost universally used. Iodized collodion with pyrogallic acid and formic acid developer, as used by Mr. Claudet, has attracted some attention, as yielding very rapid results, but the process does not seem to have superseded that in common use to any extent. The double sulphate of iron and ammonia, originally proposed as a developer in our columns, has come into considerable and satisfactory use. The method published by Mr. Blanchard, of using a weak solution of iron with an equal part of citric acid, for intensifying, has been largely adopted.

Enlarging processes have been steadily improving. Mr. Stuart has, by his improvement in the solar camera, materially reduced the time of exposure for direct sun printing. Mr. Sydney Smyth has by the use of a tinted paper, and by the occasional use of a modified plan of development, been enabled to get very artistic and fine results by development printing. And Mr. Aldis has succeeded in applying the oxhydrogen light in solar camera printing with great success.

An important question in the economy of the art