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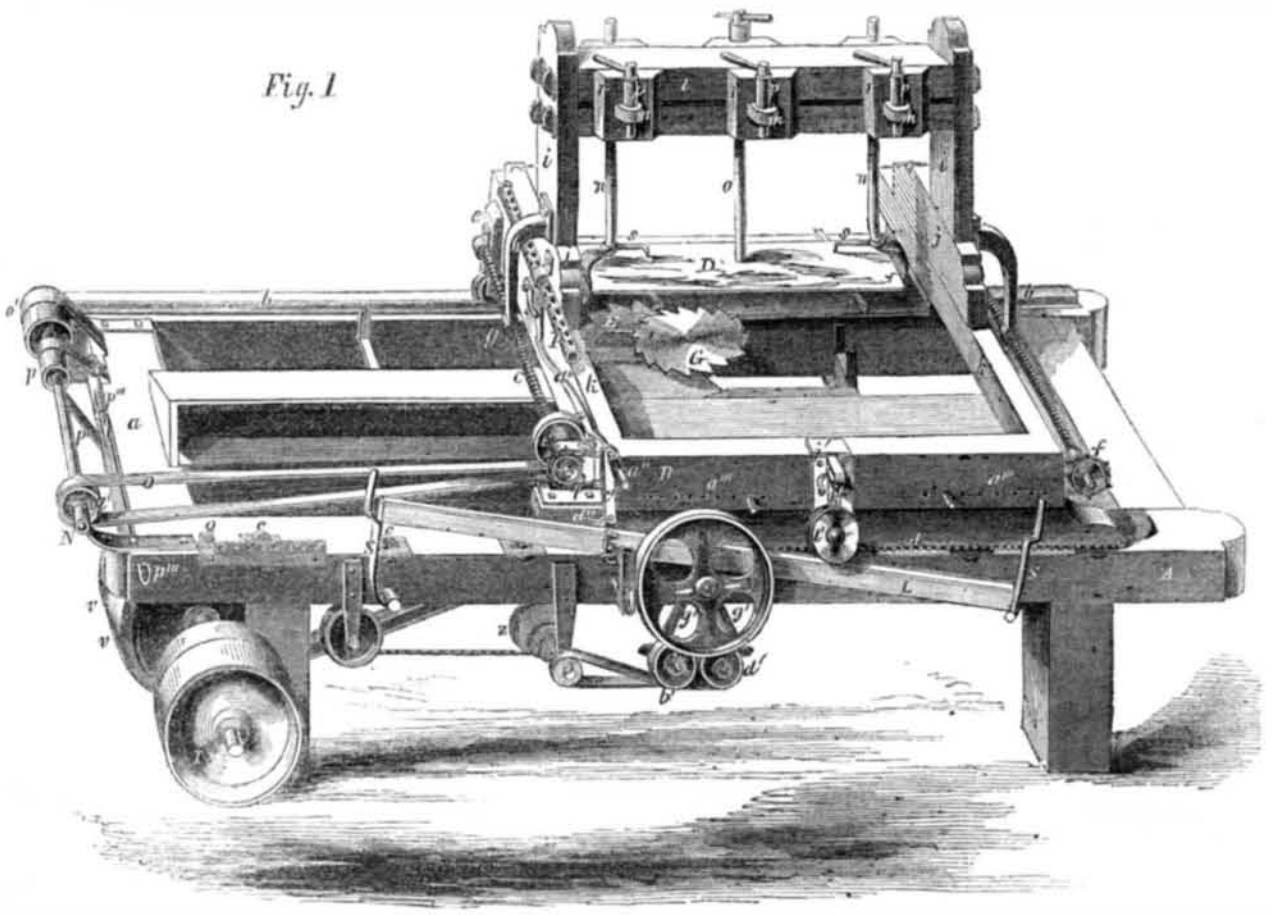
BATCHELDER'S SAWING MACHINE.

Fig. 1



Improved Sawing Machine.

This is a machine for sawing laths, fence pickets and similar stuff direct from the log, and the improvements are such that its feeding and setting motions are perfectly automatic.

In our engravings, Fig. 1 is a perspective view of the machine, Fig. 2 is a plan view, and Fig. 3 will be explained in the course of the description. A is the frame, having crosspieces, *a*, and carrying on one side a V-shaped way, *b*, and on the other a series of rollers, *c*. B is a rectangular carriage placed on the frame and provided with rollers to run on *b*, and a rack, *d*, having a groove in it, runs on the wheels, *c*. At each end of the carriage a screw, C, is placed, fitted into bearings, *e*, and each is provided with a toothed wheel, *e'*, around which there passes an endless chain, *f*, or they may also be connected by miter gear and a shaft. Each of these screws passes through a nut, *g*, formed at the lower ends of curved bars, *h*, which are connected to the uprights, *i i*, placed on horizontal bars, *j*, that can slide freely along the end pieces, *k*, of the carriage, B. The upper ends of *i* are connected by a crosspiece, *l*, which is slotted horizontally and has plates, *m*, placed in it, these plates being also slotted vertically, and having rods, *n n o*, passing through them on one side. Through the opposite ends of *m* pass rods *p*, provided with eccentrics. A block, *r*, is placed on each end of the plates to tighten up against. In Fig. 2 this upper work is removed, as it would obstruct the view of the other parts. By turning the rods, *p*, the upper ends of rods, *n n o*, will be tightly clamped against the crosspiece, *l*. The lower end of the rod, *o*, has a screw on it, which enters into the top surface of the log, D. The lower ends of *n n*, are bent and forked, and they are driven into the ends of the log where they are secured by hooks, *s*, entering into the top of the log. E is a vertical circular saw placed on an arbor parallel to *a*. G is a horizontal saw, also on an arbor, and the edge just touches the plane in which the vertical saw, E, is placed, Both these saws are driven by belts, *v v*. J are small shafts placed underneath A, and driven by a belt from the saw arbor. One of these shafts, J, has a pulley on it, and a belt passes over its outer end, this belt also passing around *b'*, which has its axis attached to a vibrating plate that is pivoted to the side of the machine. A pulley, *d'*, is attached to the opposite end of this plate, the bolt passing underneath it, and rotating it. To the outer sides of these pulleys, pinions, *e' f'*, and to each end of the vibrating plate a bent rod, *g'*, are attached. The upper end of these bars, *g'*, is attached to a bar, L, which is placed loosely on a small shaft projecting from A, and on which it can swing loosely. The pinion of M gears into the rack, *d*. In the side of the carriage, B, which adjoins the bar, L, vertical guides, *j*, are secured (seen in vertical section in Fig. 3) and between these guides a slide, *k'*, is placed, this slide having a roller, *l'*, at its lower end. A pin, *m'*, is also attached to the lower end of *k'*, which fits into a slot in L.

To the upper end of slide, *k'*, is attached a stud, *g''*, which projects out through a spring catch, *h''*, the lower end being attached to slide, *k'*, and is inclined to spring out against a key-pin, *i''*, which works through the outer end of the projecting stud, *g''*. The upper end of the spring catch, *k''*, forms a bow *n''* projecting out, the inner end is made to catch on a plate, *j''*, when the lever handle of key-pin, *i''*, is turned down; when turned up, it catches on a pawl, *k''*, if the handle of the lever, *a''*, is raised. The lower end of pawl, *k''*, is

Fig. 2

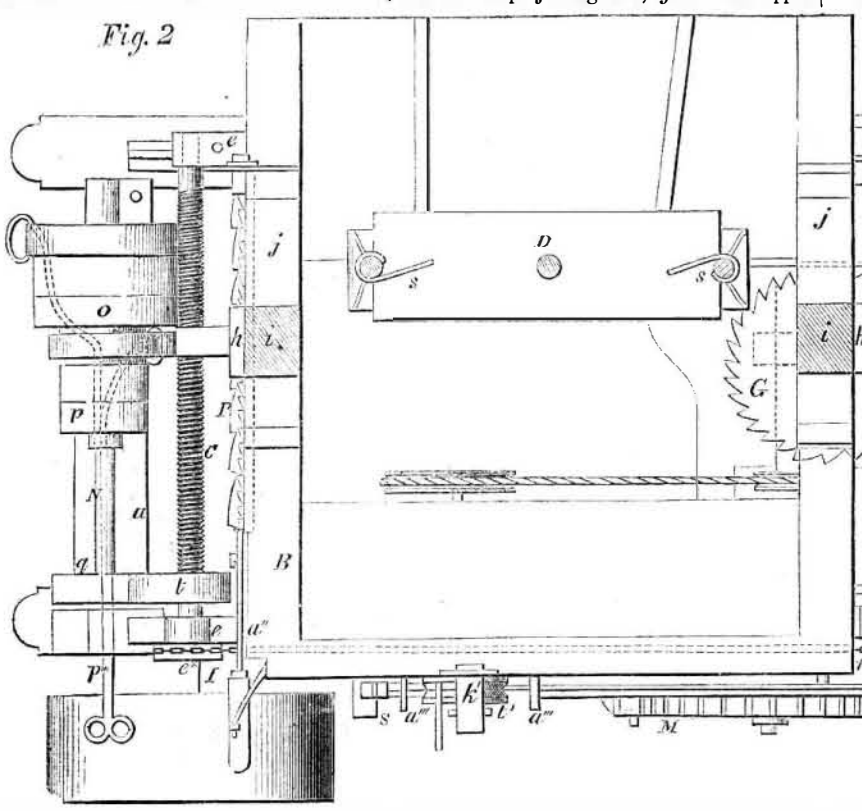
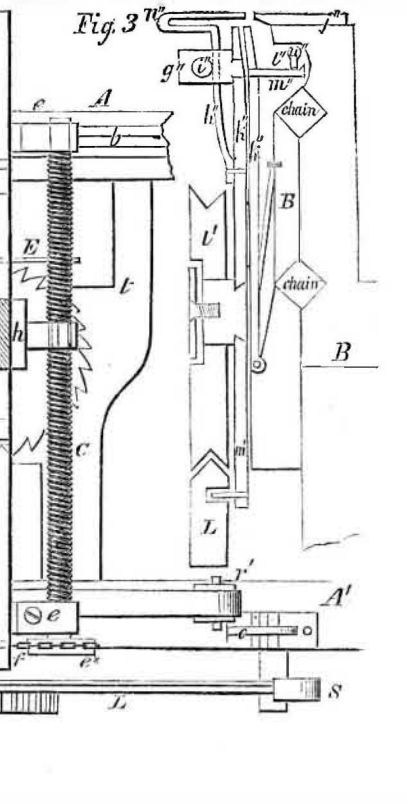


Fig. 3



hinged to carriage, B, the upper end is thrown out by a small spring in the back of it, and is drawn in by a short arm, *l''*, working in a staple or hook, *m''*, attached to pawl, *k''*, said arm, *l''*, is attached to a small rock-shaft, *n*, in the side of carriage, B, which shaft leads to the lever, *a''*, and is connected to it. N is a shaft which is placed at one end of the frame, A. The shaft is driven by belts, *o' p'*, one of which is a cross belt. N has a pulley, *q'*, at one end around which a belt, O, passes, and also round a pulley, *r'*, on the frame and through loops on B, and also under a pulley, *t'*, on one of the screws, C. The outer end of the lever, *a''*, has a pendant bar, *c'*, placed loosely on it, this bar carrying a forked lever, *d''*, pivoted to the carriage, B. The inner end of the lever, *a''*, works under a pawl, placed below a circular rod, P, attached to *j*, and provided with rack teeth different distances apart. To the outer side

of the frame, A, are two plates, Q (one being behind M), provided with a series of teeth. Two spring catches, S, are attached to A, one to meet each end of L.

The operation of the machine is as follows: The log, D, is secured to the lower ends of the rods, *n n*, and motion is given to the shaft, I. The two saws, E G, are rotated by the belts, *v v*, in opposite directiens, so that the log will not be affected by their motion. The feed is given to the log by the wheels, *b'* and *d'*, moving M, and its pinion operating the rack, *d*. The carriage has a reciprocating motion produced by wheels, *d' b'*, being alternately in contact with M, these wheels being operated by the bar, L, which is moved in its inclination so that *l'* has always to travel up it, and according to the length of the log, pins in holes, *a'''*, push back the springs, S, and throw it in the opposite direction, thus reversing the motion of the carriage. The log is set to the saws, at each movement of the carriage by the screws, C C. This is done by means of the small forked levers, *d''*, which strike against the projections on Q Q, at the end of each stroke. These levers, *d''*, actuate *a''*, and cause the belt O to operate *t'* on one of the screws, C, and the rack, P, is released so that the frame, *i*, can slide the exact width of the lath to be cut. When one row or course of stuff is sawed off the log, D, it is moved to its original position, by shifting the belt, *o'*, by means of the belt shipper, *p'''*, from the idle pulley to the working pulley, the belt, *p'*, by the same movement being also thrown from the idle into the working pulley. It will be seen from the above description that the machine works automatically, the log being fed to the saws in both directions, and also set to the saws at each stroke.

It is the invention of J. H. Bachelder, of Rome, Mich., and was patented by him Sept. 29, 1857. He will be happy to furnish any further particulars.

Preventing Steam Boiler Incrustations.

Although much has been said and written on this subject, it is still a question of much interest. It is taken up by the London *Engineer* of the 12th of February, in which opinions long since put forth by us are enforced. It says:—"We believe that nothing short of an entire revision of the prevalent practice of feeding boilers can be satisfactory. The proper way is to purify the water before it is put in the boiler, not after. That is a full, sufficient and comprehensive solution of theproblem of incrustation and its prevention."

These are sensible words. In our opinion, there is not a railroad, and but very few factories in our country, but could find, at no very great expense, means to supply their engine boilers with soft water. The incrustations in steam boilers are deposits from hard water used in feeding, which leave a coating of stone—sulphate and carbonate of lime—on the inside of the boiler. As this stone coating is a non-conductor of heat, of course, it causes an immense loss, by the excess of fuel required to generate the steam, while at the same time it renders the metal liable to be burned, by keeping the water from direct contact with the iron. Soft water employed for feed entirely prevents the formation of such incrustations, and if possible, no other kind should be used. There are many situations, however, such as in cities and villages, where soft feed water cannot be obtained to supply steam boilers—situations where hard water is the only supply. A simple, cheap, and efficient means of preventing incrustations in such places is a desideratum. In former volumes of the Scientific American, more varied and useful information regarding such means or agencies can be found, we are confident, than in any other periodical or work whatever; but we have been informed that the patent of Robert McCafferty, of Lancaster City, Pa., obtained April 14, 1857, embraces perhaps, the most efficient method of doing this yet discovered. If so—and from its nature, we think it must be good—it should be generally introduced. From his specification we will therefore give a condensed description of the invention:—

The substance employed is black gum catechu, (which is well known to dyers and tanners). Half a pound of this catechu is put into a steam boiler of 100-horse power, in which it is dissolved by the water, to which it imparts a color resembling pale brandy, or a light reddish-brown shade. This is to commence operations. While the boiler is in use during the week, the water is kept as near to this color as possible, by adding small pieces of the catechu.

This is the sum of the invention. Mr. McCafferty discovered that when the water was maintained at the shade described, no incrustations were formed in the steam boiler which had been previously subject to them. And not only did the catechu prevent scale forming in the boiler, when hard water was used, but it removed thick incrustations which had been formed, and converted them into a kind of soft *slush*, which was easily forced out by the blow-off cock.

Catechu dissolves easily in water, and is one of the most powerful astringent gums known. It is a simple and more convenient agent for combining with the lime in the water, and preventing it forming a coat of stone on the boiler, than sawdust, blocks of oak, sal ammoniac, and many other things that have been employed; but whether it is superior to molasses, oil, and tar, which have also been employed, we are not prepared to say. We hope it is, because we welcome every new and useful improvement.

Catechu has been used before for the same purpose, but not by itself, as Mr. McCafferty has employed it. M. Delfour, of Paris, tried it some years since, in combination with various salts, as described on page 40, Vol. VI, Scientific American, and obtained good results therefrom.

In *Newton's London Journal* of last month, (February), there is a description of a composition for removing and preventing incrustations in boilers, for which a patent has been obtained by Henry Hobbs and Edward Easton, of London. It consists of arsenious acid, (white arsenic of commerce), and an alkali—the carbonate of soda (sal soda) being preferred. These are mixed together in equal quantities (by weight) in a vessel, with a small quantity of water—about a gallon to five pounds—and are kept boiling until the arsenic is dissolved; the mixture is then cooled down slowly, and is ready for use. About one gallon per week is sufficient for a 40-horse power boiler; and all that is required, it is stated, to keep the boiler perfectly clean when using it, is to blow-off regularly at the lower cock. This may be a very good composition for the purpose, but it is certainly a dangerous one to use; and great caution and care are necessary, to guard against evil results.

We have received a very original and interesting communication on this subject from Henry Fisher, M. D., of this city, in which he describes experiments made by him with the metal antimony to prevent incrustations in steam boilers. For good reasons we here mention the substance he has successfully experimented with, as we have not been able to find room for his article in this number.

"Will the Atlantic Telegraph Operate?"

Messrs. Editors—The Scientific American of March 13th contains an article under the above caption. I entirely differ with its writer as to the practicability of working three thousand miles of the proposed submarine cable with a battery totally inadequate to fuse the conducting medium, and I base my belief upon actual experiments made, not upon cable in coils, nor submerged; but upon parallel lines of subterranean cable.

Rest assured the enterprising projectors of this immense undertaking have not entered into it without adequate research, and despite of groundless alarms, you and I will probably live to see numerous channels of thought traversing the broad Atlantic. W. H. C.

Morris's Corrections for Local Magnetic Attraction.

[concluded from page 222.]

The report of Capt. Pendergrast and Mr. Dunnington, master of the U. S. steamer *Merrimac*, also settles the fact that the corrections of Morris were perfectly satisfactory during about fifteen months' experience, between the latitutes of 50° and 13° N. The reports say:—

U. S. Steam-frigate Merrimac,
Boston, April 15, 1857.

Sir—I have the honor to enclose herewith the report of Lieut. Dunnington, in regard to the standard-compass of this ship, as corrected for local attraction by Capt. Morris, and I fully concur in opinion with Mr. Dunnington as to the invariable correctness of our compass. As applied to this ship, it has proved all that could be desired, and I have no hesitation in recommending his plan for general use in all our public ships. I am very respectfully your obedient servant,

G. J. Pendergrast, Captain.

U. S. Steam-frigate Merrimac,
Boston, April 14, 1857.

Sir—In obedience to your orders, I herewith enclose a number of azimuths taken for the purpose of testing the standard-compass of this ship, which was corrected by Capt. Morris in January, 1856, for local deviation. The azimuths I have put in the form prescribed by the Bureau of Ordnance and Hydrography. You will see, by the observations, that the standard-compass has invariably given within two degrees the variation as shown by the chart; and this slight difference, I think, is owing to my not always finding a place where the azimuth would give the same heading as the standard-compass.

It is also very difficult to read the headings of the ship by both compasses to a degree, especially the one in the binnacle, when taking observations.

Running from New York to Southampton, we changed the variation gradually from 9° W. to 30° W. The sights taken show that the standard-compass was always correct.

In running from Southampton to Barbadoes, we changed the latitude from 50° N. to 13° N., changing the variation from 30° W. to 1° 30′ E. The observations show the compass to have been correct during the entire run.

As I have always found the standard-compass correct by my observations and the different bearings, I take great pleasure in saying that I am fully convinced that Capt. Morris has succeeded in correcting the standard-compass of this ship for local deviation. Very respectfully your obedient servant,

Jno. W. Dunnington,
Lieutenant, U. S. N.

Great doubt was expressed, even after the experience of the *Merrimac* and the *Mahlon Betts*, as to whether the corrections applied in north latitude would be of any value in the southern hemisphere, and their were many substantial reasons for this doubt in the minds of scientific and practical men. Almost every vessel of iron corrected in England had been obliged to resort to a table of errors, at least, and many of these, in spite of the corrections and the tables, were found to be quite out of the way in moderately high southern latitudes. There is still some reason to doubt the entire success of Capt. Morris's plan, in south latitude, in iron ships, because we have no positive proof of it, but I trust this doubt will be solved when we hear from the *Argentina*. But in steamships of wood the plan has been tried in two or three cases in the other hemisphere. Capt. Dearborn, of the *Yang-Tze* paddle steamer, reports from Bombay that "nothing could work better than my compasses." In this case the error was considerable, on some courses several points before leaving New York.

The corrections were also applied to the U. S. steam-frigate *Minnesota*, Capt. S. F. Dupont, who writes to me from China that his report to the Bureau will be "altogether favorable," and that he fonnd no deviation on getting into south latitude, and that all his landfalls were correct by compass. These are satisfactory evidences of the correctness of Morris's principle, as far as they go, but the *savans* say there is still room for doubt as to whether he has found a way of correcting all cases of deviationarising from local attraction in all places. Let us grant that this is true, and let us solve the doubt, by giving him every steamship and every iron ship in the country, to correct and especially those which are going into south latitude.

The U. S. steam-frigate *Merrimac* has gone to the Pacific and has been heard from as far as Rio Janeiro, but I have seen no official or other report of her compasses since she went into the southern hemisphere. That they will have proved to be correct, like the *Minnesota's*, I have no doubt.

The limits of a letter will scarcely warrant me in going more at length into the importance of correcting all ships for local attraction. It is a subject which merits the serious consideration of shipowners and underwriters, for it is a prolific source of loss of life and property; it should commend itself to the notice of Boards of Trade, Chambers of Commerce, and of Congress, just as much as the lighting of the highways of the sea, just as much as any other means for the security of navigation.

Happening to be on board of an English iron vessel recently, the *Witch of the Seas*, I inquired of the captain if he had any trouble with his compasses? He answered:—"Nothing but trouble; I have had them corrected several times in England, by the most approved methods; they do tolerably well in the Channel, but on going south, they gradually get out, until in high south latitude, I can depend on them no longer. I am obliged to correct them daily by azimuths, and on nearing the land, at the Cape and in Australia, I might as well be without a compass."

It must be remembered that Capt. Morris professes to entirely neutralize the effect of local attraction within a certain distance of the standard compasses; he makes no table of corrections; does not necessarily swing the ship to ascertain the amount and the character of the error; uses no "mass of unmagnetized iron," as recommended by Airy, the Astronomer Royal, and never resorts to placing his compass aloft, excepting in making experiments.

He uses magnets of greater or less intensity, prepared and packed in a peculiar manner. Trusting that these remarks may prove interesting, I leave the subject with the single suggestion that however imperfectly I have treated it in a scientific view, you may depend on my disinterestedness, and my single desire is to do Capt. Morris and navigation a service. R. B. Forbes.

New Ideas.

We frequently receive letters that contain queer suggestions; the writers, being full of comic veins, let off their fund of humor on our editorial heads. As a sample, here are two inventions:—First, a Jersey gentleman thinks (at least he says his wife does, and that's the same thing) that some old bachelor must have invented the "diaper" we noticed a few weeks ago, and that as an improvement his wife has invented a novel piece of apparatus. She proposes to attach an india rubber bag to the feminine shanghai, in which it can deposit its eggs, and thus prevent them from being lost; and as this is a fast age, she would also train them to come to the kitchen door, and announce when they had deposited an ovum. Secondly, a southern correspondent, much deploring the great waste of time and expense consumed in eating, has invented a chewing and stuffing machine, by which all the inconveniencies of the table will be removed, and all that need be done is to place a piece of food in the hopper, turn a handle arranged on the barrel-organ principle, and the food will be masticated, eaten, and digested in a few minutes, to the tune of "Yankee Doodle." After this, who shall say there is no fun in science, and no comicality in invention?