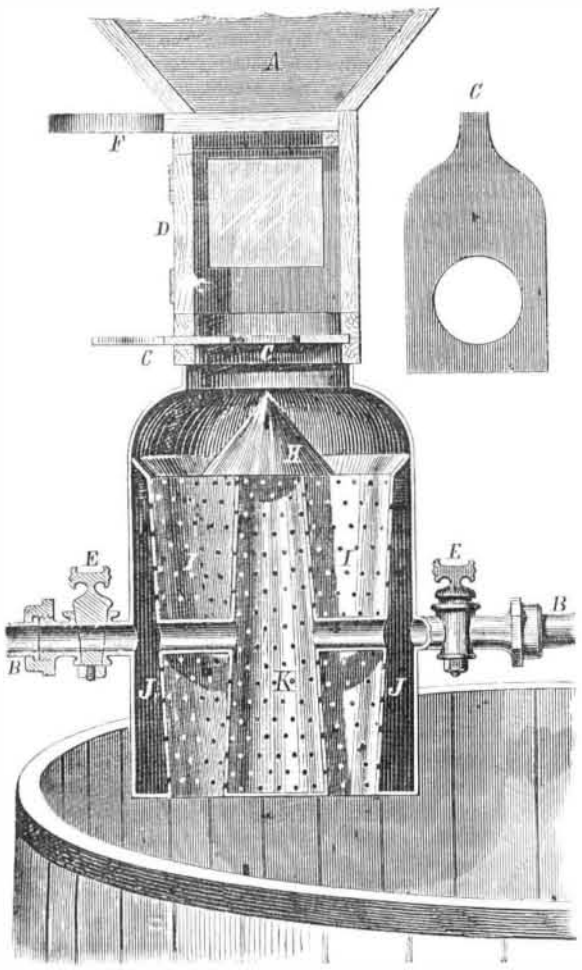
HARRIS' PATENT SELF-ACTING MASHING MACHINE FOR THE USE OF BREWERS.

This machine, after having been tried for a considerable length of time in one of the largest breweries in this city with success, and its merits thoroughly tested, is claimed to be a great improvement upon any other machine now in use, and its construction to be founded upon a more scientific basis.

From the porous structure and absorbent nature of malt, all that is really requisite to produce complete saturation is to bring each separate crushed grain or particle of grain into conjunction with the mashing water. More than this, such as violently striking or stirring the malt with quickly-revolving arms, rakes, or oars, does positive injury. It destroys the pores, beats the grain into a paste, and prevents the water



from flowing readily into and dissolving its soluble parts.

Before proceeding, however, to describe this new invention it may be well to give a slight sketch of the different means heretofore employed.

Up to the present time there have been three methods of mashing, each method having various modifications. The original course was to mash by hand with oars (stout bars of wood with sundry cross pieces at the end). The great objection to this was that the cover necessarily being off the tub, the temperature of the mash fell too low, rendering the ale produced from it liable to sour, besides the impossibility of properly stirring the contents of a large tub towards its center. Machinery was then introduced to do the work while the tub was kept closed, and the loss of heat avoided. These machines were of a variety of forms, but nearly all of expensive and complicated construction. The principle was the same in all—namely, to thoroughly mix the malt and water together in a closed tub. So far they succeeded, but it was afterwards discovered that the presence of machinery in the tub, among other evils, was a great hindrance to drawing off the whole of the extract. Water sprinkled on the top, instead of equally permeating the grain, dissolving, and carrying with it all the soluble portion, would form channels, and run down cracks and fissures, caused by the shafting preventing the grain from evenly rising through the sprinkling water.

The next improvement was to mash the malt and water together as they passed through a machine before entering the tub, leaving the latter clear of machinery. This machine consisted of a cylinder, down the center of which passed a shaft with cross arms made to revolve with immense rapidity. The malt and water coming together and flowing through the cylinder, were in this way completely mixed. The very rapid motion necessary, however, has been found to prove destructive to the internal structure of the grain, beating it too much into the form of a paste, and preventing the sprinkling water from properly permeating its pores.

An efficient machine that would be unaccompanied with any of these drawbacks has been a want felt by all thoughtful and scientific brewers; the being able to dispense with the aid of extraneous power being a further desideratum.

Such a machine, it is claimed, has now been invented. Its construction is shown in the accompanying engraving. The mode of working is as follows:

The ground malt being put in the hopper, A, and the water being heated to the proper temperature in a boiler or vessel (placed on an upper floor), from which the pipes, B, lead, one of a set of slides, C, having different sized openings, according as a thick or thin mash is desired, is inserted. The door, D, is closed, the two cocks, E, are opened to their fullest extent, and the slide, F, drawn out to the edge of the box. The malt runs down past the window, G, enabling the operator to see that it is working properly, and notifying him when it is all down. The malt falls on to the conical cap, H, dividing and passing on in a narrow stream to the space, I. Here it is met with, and has to pass through a large number of fine jets of water, discharged with great force from the vessel, J, and chamber, K, thoroughly saturating the grain, but without injuring its porous structure. The mash then falls into the proper tub placed under the machine. As soon as the malt is all through, the water is shut off, the slide, F, pushed in, the open slide, C, withdrawn, and a blank one inserted. This fitting in a double frame effectually prevents the escape of steam. The door, D, offers a convenient means for afterwards washing the machine off with a hose or sponge.

Among other things, the inventor claims these important advantages:

Simplicity of construction and cheapness, as no belting or connecting machinery is required. The machine being self-acting, all expense for steam or other driving power is absolutely saved; while the result is greatly superior—a much larger extract being obtained from the same amount of grain than when mashed by any of the old methods.

Patented, July 12, 1870. Machines manufactured at John Trageser's Steam Copper Works, 447 to 453 West Twenty-sixth street, New York city, where all information regarding them can be obtained.

PATENT METALLIC POST BUTT.

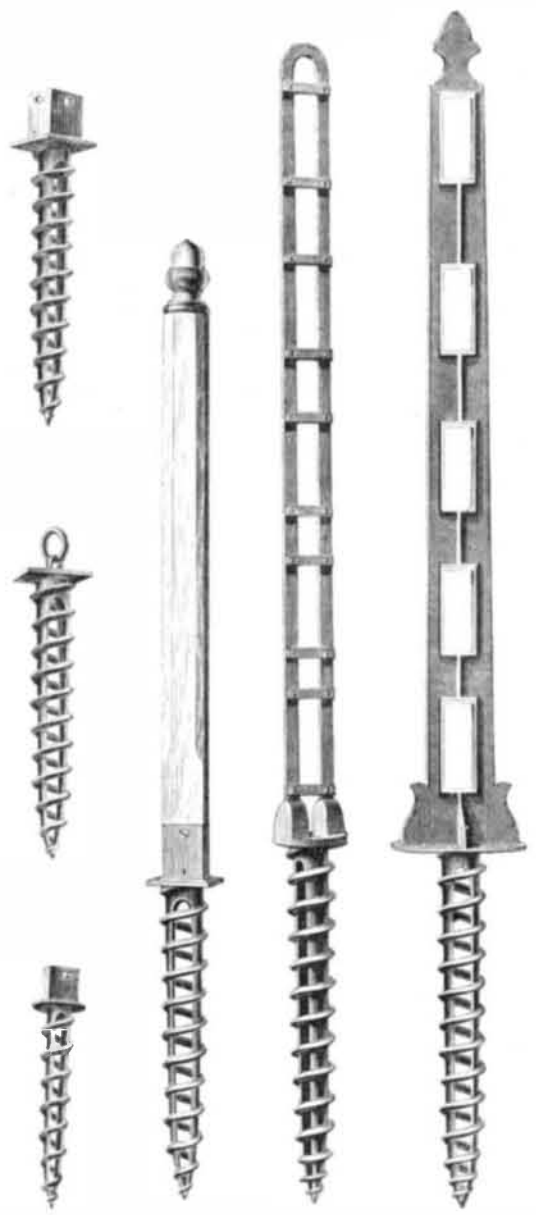
It is well known that a wooden post, having the butt sunk into the ground, will last for a few years only; the part in the earth will rot while the body of the post remains good. Many devices to make a cheap and durable post butt have been tried, but most have failed to give satisfaction.

The patent metallic screw post butt, shown in the accompanying illustrations, is designed to supply this want, and while it makes a cheap and durable post butt, it has another merit equal to, if not greater than its durability, and that is, that it can be put down without digging, saving time and labor.

This butt consists of a screw and a water-proof socket, having a flange that fits to the ground when the butt is sunk into the earth. The screw is gimlet-pointed and skeleton in form, so that in entering the earth the ground fills up the inside of the screw, making the butt solid. The body of the post is fitted into the socket with a small shoulder, when the post is complete, having a metallic butt that will last a long time.

The body of the post may be of any cheap wood, or the entire post may be cast iron, or the top wrought iron cast into the butt, as shown in the different engravings.

These butts are made of different sizes, and are equally well adapted for all kinds of fences, awnings, and hitching posts,



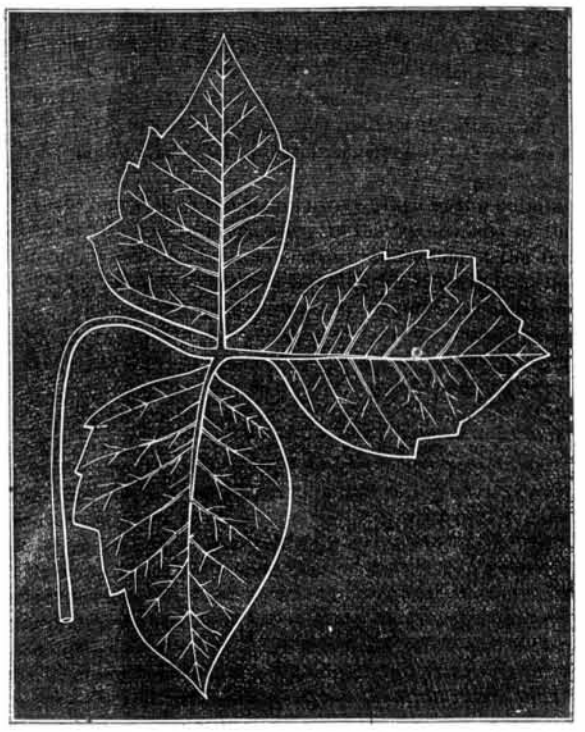
trellis work for yards and gardens, grape arbors, vineyards, telegraph poles, hop poles, ornamental seats for yards and parks, and for every purpose for which the old style of wood or iron post is used. The hitching post can be put down by removing but half a brick.

These butts are especially suitable for grape arbors and vineyards, as no digging around the roots is necessary. For prairie fences they are gotten up with a wrought-iron top for wood or wire. Those for ornamental seats have been adopted by the Superintendent of the State Capital Park, at Harrisburgh, Pa. We are informed these butts have been tested thoroughly for various purposes, giving entire satisfaction for strength, durability, and convenience.

A company to manufacture these butts has been formed, of which W. O. Hickok, of the Eagle Works, Harrisburgh, is President. Parties wishing to manufacture on royalty may address for further particulars the Harrisburgh Patent Screw Post Manufacturing Co., 411 Market street, Harrisburgh, Pa

Poison Ivy.

I will pluck a leaf with a pair of fire-tongs, at arm's length, press it dry so as to make an exact drawing of it, and write a full account of this venomous plant. I will try to make the whole matter so plain that everybody can detect and avoid the vile thing which is making me so much trouble. These were some of my midnight thoughts, as I feverishly turned



in bed while suffering from its effects. Water saturated with salt, was my only remedy. The poison was followed by two generous crops of boils, about fifty in number, lasting for over two weeks. Now I can only look at the plant with a sort of subdued feeling, as though it were more than a match for me. Look out for *Rhus toxicodendron*, which trails in the sand, or among the bushes, or lurks in the grass like a treacherous serpent! To touch it means a face swollen to blindness, great irritation, itching, and smarting, and burning of the parts affected.

Poison ivy, or poison oak, is a humble shrubby vine, with light-green leaves and clusters of greenish flowers, looking something like the flowers of the grape vine. The leaves are compound, consisting of three leaflets, the size and shape of which are shown in the annexed cut, which illustrates the veins of the underside. It belongs to the sumach family, a group of plants which has rather a bad reputation, on account of several poisonous species it contains.

To some people it is harmless, even when the sap is rubbed on the skin, while others are sure to be affected even by touching the naked stems and buds. I have known instances in which some members of the same family were easily poisoned while others were not at all affected. Why do we not get vaccinated, as it were, and never get poisoned a second time? Do our entomological friends find any insects that can eat the leaves?

The plant most likely to be mistaken for poison ivy is the Virginia creeper.—*Entomologist.*

A 35-tun Gun.

We abstract from the London *Standard* the following description of the forging of a double coil which is to form a part of a 35-tun gun, now making at the Royal Gun Factory at Woolwich:

"Prior to the celebration of the chief work of the day the visitors present were taken to see the operation of coiling a 7-tun iron bar, drawn red-hot over a previous coil weighing about 4½ tuns. This coil was intended for one of the 10-inch guns, or 400-pounders, of which nearly one hundred will be made in the course of the present financial year. Some of them also took a glance at the colossal boring machine, where the trunnion-hoop of the 35-tun gun was being bored with a cylindrical aperture sufficiently large to receive the breech coil. The weight of the metal is twenty tuns, and the diameter of the aperture, as produced by the punching, is 40 inches. This is several inches too small for the gun, and the aperture is brought to its proper dimensions by the process of boring.

"About four o'clock the visitors were taken in the building known as 'the forge,' preparatory to the appearance of the great coil, which had been subjected to the action of the furnace for 24 hours. The men being all at their posts, and the gigantic tongs of 12 tuns weight being brought into position, the iron door of the furnace was raised. The tongs, swinging from one of the steam cranes, and manned by nearly twenty men, were thrust into the furnace, and drew out the massive coil. This being slewed round, the coil was thereby carried to its place, and deposited under the steam hammer.

Concerning the coil itself, it may suffice to say that the outer coil weighed nearly 11 tuns, being formed of eighteen ordinary bars joined together at the ends, the total length being 201 feet. The inner coil, 170 feet long, weighed about 9 tuns, making, therefore, a total of 20 tuns as the weight of the whole. In a minute after the coil was withdrawn from the furnace the great hammer began its work, thundering down upon the whole hot metal, speedily reducing the hight of 9 feet or more, which the cylinder originally possessed. The broad face of the hammer, having a diameter of nearly 5 feet, was insufficient completely to cover the upper end of the coil, but the latter was shifted, so as to secure equal pressure. Presently a hollow mandrel of suitable size, in form resembling an ogival-headed shell was placed, point downwards, on the upper end of the coil, and driven fairly into the center of the mass, so as to fill up the otherwise open space. The coil was then skillfully thrown on its side, and made to rotate on the ground while the hammer struck its sides, the inserted mandrel preventing any distortion of figure. Lying on its side the coil still stood fully 5 feet high. The entire operation was most satisfactorily performed, its object being to weld together the whole of the coiled bars into one compact mass. To complete the operation the coil would have to be re-heated to the welding point, and hammered at the other end. So far there were no signs of failure, and we can only hope that the gun will stand as well in the proof as this portion of it has in the heating.

"Concerning the 35-tun gun, we may observe that another formidable operation has to be gone through, namely, the welding together of the trunnion hoop and the breech coil, when about thirty tuns of metal at a white heat will have to be dealt with. As for the time when the great gun itself will be ready for proof, our original estimate will most likely hold good, and we must not expect to find this stage arrived at until nearly the end of the year, though if it were needed the process would be expedited. In regard to the rifling of the gun, the twist will be sharper than that which has been observed in other big guns of the Woolwich pattern. A greater spin will thus be given to the projectile, which is the more necessary, as the smallness of the bore, coupled with the extreme weight of the projectile, renders the latter unusually long."

Correspondence.

The Editors are not responsible for the opinions expressed by their Correspondents.

Wharves and Piers for New York.

Messrs. Editors:—As I understand, the question as to the best mode of constructing the wharves and piers for the city of New York is undecided, consequently still an open one. In reading the plans presented in your columns, though varied and differing materially in detail, yet I do not find them covering points that are to my mind important, and should be considered in the reconstruction of the wharves and piers for your city. As they may aid in making the present attempt a success, I venture to present them for the consideration of the commission appointed to decide upon the best plan presented for this great work, so necessary to meet the wants of trade and commerce, and as a sanitary measure for the protection of the health of your crowded city. Although wood has heretofore been the principal material used in the building of wharves and piers, yet it will be generally admitted that, though least expensive at first, it is, in the long run, the dearest, as it is less serviceable than stone or iron, and from its perishable quality requires constant repairing and renewal, and its absorbing nature makes it an active agent in poisoning the atmosphere with its exhalations drawn from the liquid filth floating in the docks washed from your streets and sewers. Stone and iron not being subject to these influences, the most durable of the two should be the one selected as the proper material for the principal part and the most exposed parts of the structure; and believing iron that one, I would propose that cylindrical piles of iron be sunk down to a solid ground base, and when thus set the piles be filled with stone and cement up to or above high water mark. The frame-work for the piers to be of iron, and the parts forming the water wall to be plated with iron, rolled to the desired size, these to be fitted in grooves in the sides of the piles, one above the other, up to the "string piece," which should be of heavy timber, and laid so as to extend a sufficient distance beyond the face of the pier, to prevent vessels from being chafed by the face of the walls. The plates forming the sides of wharves and piers to be set down below low water mark, and the open space within to be filled in with stone, coal ashes, and earth above high water. A double advantage would be thus gained, the prevention of floating decaying matter finding lodgment beneath the wharves and piers and giving additional anchorage to the structure, both of which are desirable and necessary. I would propose conducting the sewerage through sewers of iron, these to be laid under the piers to the end where they would discharge their contents in the currents, and would be thus more readily carried off to sea. To lessen the jarring caused by heavily loaded teams passing over the piers, I would lay the cartway with heavy planking, down the center of which I would lay a double-track iron railway for vehicles to pass on and off the piers.

Objections have been often made against the extension of piers out into the river, as interfering with the natural currents of the river, thereby increasing their force by these encroachments, and making navigation more difficult and perilous. As piers are necessary for the accommodation of your shipping, and the demands for additional facilities in this particular must increase, the present is the time, it seems to me, whilst remodeling your system of wharves and piers, for this to be considered, and, if possible, provided for. To that end I would suggest the abandonment of the present plan of arrangement of the piers by the substitution of one that will secure additional length to them without the necessity of extending the heads beyond their present line. As now constructed the piers extend almost in straight lines from the river front out into the river, and as a consequence their further extension brings out the objections mentioned. I would propose that the piers be constructed so as to head "*down* stream," which would prove an important increase of accommodation in the miles of piers extending around your city, and in the form suggested the washings of the streets, which now finds a quiet harbor in your docks, would more readily float out with the tide in its course to the sea, and vessels could enter them with equal if not greater facility than now. For the several reasons that I have offered I think my plan for docks and piers has some advantages over those hitherto presented.

U. B. Vidal.

Philadelphia, Pa.

Speed of Circular Saws.

Messrs. Editors:—We notice in your issue of July 23d, that Mr. C. H. Crane writes you from Greenville, Ala., the result of twelve hours' sawing with one circular mill, showing a total of 34,050 feet of boards and plank cut. He seems to think it a remarkable day's work. We think he did very well; but Ruddock & Gifford, of Manistee, Mich., within *eleven hours,* cut 220,773 feet of boards, joists, and scantling, with two circular mills, one a 54-inch, and the other a 56-inch saw, and a siding mill 36-inch saw. They also had in use two edgers. Doubtless Mr. Crane's "circular" did not edge the boards. But, in any view, it will be perceived that this is vastly in excess of the Alabama feat. There is no doubt of the correctness of this statement, as we have the lumber inspector's certificate. Besides, the lumber was sold in Chicago by the same "tally."

The first full day's sawing done at Danaher & Melendy's new mill (two circulars), in Luddington, Mich., tallied 73,000 feet for an eleven-hour's run. Your correspondent asks, "Has it (his sawing) ever been equaled?" We ask, has Ruddock & Gifford's ever been nearly approached?

In explanation, we would further say that the *great day's* sawing was done in Norway pine timber, on trial. Logs scaling 160,000 feet were selected for the day's work, supposing this would be enough; the balance was taken as it came, from the boom. The work of Danaher & Melendy is their ordinary average now.

If your correspondent claims an advantage of timber in our favor, we will state that Cook, Gibb & Co.'s mill (one circular and edger) *averages* 25,000, and on one trial cut 40,320 feet of boards, *Southern* pine. This was at Little Rock, Ark.

Milwaukee, Wis. Menzel, Stowell & Co.

Pocket Chronometers.

Messrs. Editors:—Pocket chronometers seem to have fallen into disfavor with Mr. J. Muma, and he asks some questions concerning them, which, from a "watchmaker's standpoint of view," seem ignorantly foolish. It does not follow, because the "balance has an unlimited motion," that the hair spring can be broken by "winding or careless handling." I very much doubt whether such an accident *ever* occurred. It is certainly true that the very life can be shaken out of the watch by sheer muscular strength, so can a rat be killed by the shake of a "black and tan." But does that prove the rat badly designed or faulty in its construction? It simply shows that the rat can't stand as hard a shake as a terrier can give.

I venture to assert that no watchmaker, or any other man, ever saw so "valuable" a spring as Mr. Muma speaks of, and the very same violence and accidents will produce exactly the same deleterious "tension" upon the lever spring as upon the chronometer, and with the *additional* damage of inevitably breaking the ruby jewel.

The reason the watchmaker has "such trouble to get the spring to his notion" is not the fault of the chronometer escapement; it is the honest endeavor of the artist to adjust it to keep the most perfect time possible. The same pains-taking "trouble" attaches to the lever hair spring, when the same exactness of performance is demanded of it.

It is a lamentable fact that all kinds of watches are often treated in the most barbarous manner, and yet they are expected to endure it patiently, and without resentment. The watch, a machine as delicate as the human eye, is subjected to the violent windings and shakings of any ruthless man who may be rich enough to purchase one, but without sufficient knowledge of its delicate construction, to take the proper care of it.

Cleveland, Ohio. R. Cowles.

To Stain Butternut in Imitation of Black Walnut.

Messrs. Editors:—To stain butternut in imitation of black walnut, wash the wood thoroughly with lime water (*Liquor calcis, u. s.?*) and varnish or polish. This will give a perfect imitation of the fine lines and grains, as desired. Have never experimented on other soft woods.

Cherry washed with lime water will make *good mahogany.*

Derby Line, Vt. Frontier.

Change of Course in the Gulf Stream.

Messrs. Editors:—In the Scientific American, May 7, 1870, is a brief notice of a paper by Dr. Hayes, on the Northmen of Greenland, joined with Prof. Henry's remark that it devolved on some one to find data for the climatic changes, and suggests the theory of the first cooling of the earth at the poles.

I think that on reflection, Prof. Henry will abandon that theory as untenable, when he remembers that these changes have occurred within the historic period (A. D. 986), and not quite one thousand years ago.

It seems to me that another theory will account for the changes.

The uniformity of climate in Ireland, and the comparatively mild climate of Western Europe, is attributed to the Gulf Stream. Now from what we know of all large streams of water, they are constantly changing their courses. These changes are sometimes due to an obstruction to the current by some impediment that the stream *cannot* carry away in solution, and sometimes to a cut which the stream *does* make. Let us suppose that in A. D. 986 the Arctic current came down through Baffin's Bay, as it does at present, bringing with it innumerable icebergs and fields of ice loaded with stone and earth; and that the Gulf Stream then ran closer in to the coast of North America, and near to the east coast of Greenland. Would not East Greenland then have had somewhat the climate of Ireland or Norway, and would not the Northmen have considered it a very desirable country? Now this stream of warm water would be continually melting the ice of the Arctic current, and depositing along its west border the earth and stone it brings from the Arctic regions. Might not this be sufficient in the course of some centuries to deflect the current to the east, and so, deprived of its warm breezes from an open sea, the east coast of Greenland goes back to ice and snow.

The pouring of this current of water into the Arctic Ocean west of Norway, would render it necessary for a current to set *out* of that ocean somewhere, and if it takes the direction southward by the coast of Greenland, of course the temperature of that continent is still more reduced.

This deposit theory is not, however, sufficient to account for so great a change in so short a time (350 years); but if we may be allowed to suppose a gradual elevation of the coast of North America, and the bed of the ocean about the banks of Newfoundland, I think we will have a cause sufficient for the deflection of the Gulf Stream, and the consequent change of climate.

At any rate, I should look for the cause of the change, in ocean currents, and not in the cooling theory.

C. B. N.

Speed of Circular Saws.

Messrs. Editors:—In Vol. XXIII., No. 4, new series, page 51, and signed C. H. Crane, an article appears on "Speed of Circular Saws and Saw Mills." Is it to be understood that Mr. Crane has made any new discovery on the speed of circular saws? or to feed three inches to each revolution is in any way extraordinary?

I have seen a fifty-four inch saw running at 1,000 revolutions per minute. This would run the periphery of the saw a little more than 14,000 feet per minute. I have also seen a thirty-six inch saw running 2,000 revolutions per minute, or a little more than 1,800 feet. If a circular saw is kept nicely balanced, made of good material, and of even temper, a very high rate of speed may be obtained with safety. The very best millwrights and sawyers differ widely on the proper speed and feed of circular saws.

Steel is possessed of an amount of elasticity, varying according to the quality and temper. A circular saw running at a very high rate of speed must be hammered open between the center and rim. This is in order to give the rim a chance to expand by the velocity. A saw may be hammered so that the center will be loose and drop each way, like the loose bottom of a tin pan, and so that it will not maintain a true or straight position on the mandrel when standing still. But when at a high rate of speed, the rim will be so expanded that the saw will become true and do admirable work. But the saw will only bear a certain amount of expansion and contraction, and, as I before stated, this somewhat depends upon the quality and temper of the saw. If very soft, it would bear expansion, but not much contraction. Saws running at great velocity are more likely to become expanded on the rim. Practically it is not a question of how great a speed may be obtained, but what rate of speed is most practical for all purposes or general use.

Three-inch feed for a sixty-six inch saw would be considered light by our Western sawyers, and 34,050 feet of inch lumber to be sawed on a test day's work moderate sawing. There are plenty of circular saws in Michigan and Wisconsin that run regularly on five inch feed, and some even on six. And many of those mills average 35,000 feet of lumber per day with one circular saw running ten hours. I will mention one mill that I timed three years ago. It is owned by Messrs. McCarther & Co., at Winne Conne, Winnebago county, Wisconsin, on the Wisconsin river.

I held my watch. A log sixteen feet long, that squared eighteen inches and four side boards, was rolled on to the carriage and sawed into inch boards, splitting the last plank in 4½ minutes. Eight boards sixteen feet long were sawed in one minute. This mill was not sawing on a test at the time, but was in the usual course of running. Allowing this log to make 424 feet of lumber, and five minutes time to saw each log, the mill would cut 5,088 feet per hour, and 120 such logs in ten hours, making 50,880 feet of lumber. I was told that this mill sawed 42,000 feet in ten hours. Other mills on the Wisconsin and Saginaw rivers claim to beat that amount. McCarther & Co.'s mill feeds 3¾ inches, and the saw runs 750 revolutions per minute. I have known trouble to arise in consequence of running saws at too great a speed, and also in feeding too heavily. It should not be a question of how much speed a circular saw can be run, or how much feed can be crowded on. But what is desired is to ascertain what a saw will do, and do it well, day after day. I am inclined to think if Mr. Crane would reduce the speed of his sixty-six inch saw