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Interesting Experiments in Testing Belting.

As there is a vast amount of belting employed in our manufactories, and as the expense of maintaining the belts is very great, it becomes an important question as to what is the most appropriate material, and the best form of belting for this purpose. Two leading questions enter into this estimate, viz., the adhesive power and durability.

On several occasions we have presented information on this subject, and on page 357 of Vol. XII. and page 256, Vol. XIV., of the SCIENTIFIC AMERICAN, we described and illustrated certain experiments for testing the comparative qualities of flat leather and india-rubber belting, but have never given any information in regard to the comparative efficiency of belts of different forms. We will now detail some experiments which we witnessed a few days since at the store of J. W. Andrews & Co., No. 67 Pine street, this city, for testing the comparative qualities of good flat leather belting and tubular belting, made according to the patent granted to George Miller, of Providence, R. I., in 1854, and now manufactured by Miller & Andrews, of the same place.

The apparatus used for this purpose was a horizontal frame about twelve feet long, resembling a table without a cover. On one end was secured a shaft in fixed supports, and on the other end a similar shaft secured in supports situated on a small frame capable of sliding on the table, so as to be drawn back to tighten up the belts by tension weights attached to it by a cord hanging over the end of the table. On each shaft was a planed flat iron pulley, and also by its side a narrow grooved iron pulley. The former was twelve inches in diameter, the latter of the same diameter, but had a groove one-fourth of an inch deep, making the radius $5\frac{3}{4}$ inches. A flat 3-inch leather belt was placed over the two smooth pulleys, the grained side coming in contact with it, and a weight of 87 pounds was hung on the periphery of the pulley on the sliding frame. A crank on the shaft of the fixed pulley frame was then turned, when the belt slipped, and could not elevate the load. The flat belt was now thrown off, and a round one of half an inch in diameter was then placed on the two opposite grooved pulleys. The crank was now turned as before, when the 87 pounds weight was lifted with ease; to this was then added 87 pounds more, and that was also lifted, but not easily. The flat belt was now tried with 87 pounds of tension on the frame, when it again slipped; other 87 pounds tension were then added, and the weight of 87 pounds was lifted.

The difference of adhesive power between the round and flat belts, it will be seen by the above, is very great. With 174 pounds tension, the flat belt was enabled to lift only 87 pounds weight; with no tension on the sliding frame at all, the round belt lifted 174 pounds, which gives the latter belt four times as great adhesive power. As the tension is direct strain upon the pulley journals, it greatly increases the wear of the belt, therefore the belt which does the most work with the least tension must endure the longest.

These round belts are made by scarfing a a broad belt, and rolling it up, not spirally, lengthwise, but in a horizontal fold, so as to form a perfect round tube, with a very small central bore. Its form is stronger than that of a flat belt, and it accommodates itself snugly to the groove of the pulley, which increases the adhesiveness. A round belt of two-eighths of an inch in diameter, experience proves, is more than equal to a one-inch flat belt, and a half-inch round belt is more than equal to a three-inch flat belt. The saving of room by the use of the tubular belts, and the narrow pulleys which are employed in their use, are questions of economy for manufacturers. As the tension is much less on the round than the flat belt, they are much easier uncoupled from the grooved pulleys than would otherwise be supposed, and we believe these round belts will come into more general use when manufacturers and machinists become better acquainted with their advantages.

Messrs. J. W. Andrews & Co., 67 Pine street, this city, will be happy to show the above experiments to any persons who may desire to inform themselves more on this subject.

Cutting Fence Timber.

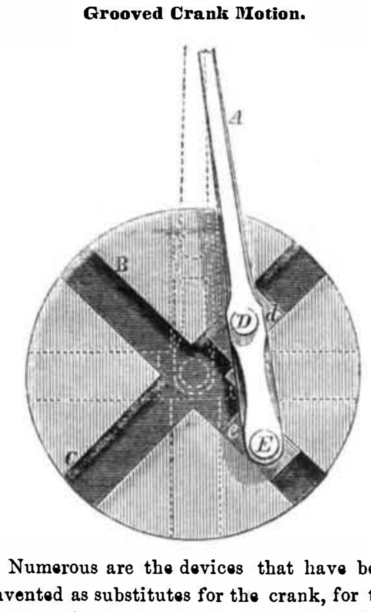
A practical farmer in a communication to the *Germantown* (Pa.) *Telegraph*, advances a peculiar theory in regard to the period for cutting timber intended for fences, especially for posts. The prevalent opinion in regard to the best time, is when the timber is most free from sap, and the very worst time is when it contains the most sap. This practical farmer referred to entertains the very opposite opinion. On one occasion he cut down some excellent white oak in the month of February and set it out in fence posts, and after this he cut down the same kind of timber in the month of May when it contained most free sap and set it out into posts also. The former posts lasted only *six years*; the latter endured twenty-two years.

This correspondent also advocates the cutting of timber for rails about the month of May when it contains most sap. He says if timber is cut for rails when the sap is running, the bark then stripped off and the rails made immediately, they will last one fourth longer than if cut at any other time and have the bark left on. The inside bark of the wood is the first to decay and rot; being of a porous nature it contains air and water which carry the process of decay into the wood. When the bark is peeled off, the sap soon dries and prevents decay." All experience goes to prove that the bark should always be peeled from chestnut or other rails in order to render them more durable; this is well known to every farmer, but it will hardly be conceded that the best time for cutting rail timber is when it contains most free sap. This is a practical question however which can only be decided by experiments, and it is one of no small importance, as a vast outlay is caused annually for repair of decayed fences.

The Nineveh Marbles.

It is related by historians that in "the days of old" there lived a famous warrior in Assyria named Ninus, who after conquering cities and provinces without number, at last founded his capital on the banks of the river Tigris, and called it Nineveh after himself. Whether this account of the origin of this city is true, or not one thing is certain, the Bible informs us that in the days of Jonah, the prophet of Israel, Nineveh was a great city, containing a population of 120,000 persons who could not distinguish their right hand from their left—young children—which would make the entire number of its inhabitants be about 600,000, the infants being about one-fifth of the whole. Strabo states that it was larger than Babylon, that its circumference was 47 miles, and that it was surrounded with walls 100 feet high, and so broad that three chariots could drive upon them abreast. It was distinguished for its riches, the grandeur of its temples and palaces, and was altogether for a period the most famous city in the whole world. It stood several sieges and was taken a number of times before the christian era; still it was a place of much importance down to the seventh century (A. D.) when it was completely destroyed by the Saracens, and left a huge heap of ruins. In the course of centuries the soil grew over these ruins, and Nineveh became outwardly but an extended grassy mound on which the Arab shepherd fed his flock, and pitched his tent in perfect ignorance of what was beneath his feet. But the finger of God was upon it, for with only the record of the Scriptures for his guide a young Englishman—Layard—sought for and discovered Nineveh again a few years ago, and exhumed from its subterranean courts some of the most remarkable works of ancient art yet discovered. Several of these are now in our own city, and have been presented by James Lenox, Esq., to the Historical Society of New York. They consist of thirteen slabs of marble, on which are sculptured winged figures of men, with long hair and beards, clad in robes and sandals and some of them have armlets, bracelets and swords. The figures are more symmetrical and better drawn than those in the Egyptian temples. One of them has the head of an eagle instead of that of a man, and carries something that resembles a basket containing mystic offerings. Another has a shallow bowl in one hand and a bow in the other. The figures are surrounded with broad ornamental borders in which the honeysuckle is frequently sculptured, and across the center of each slab runs an inscription in small characters of about twenty-five lines. Most of the stones have been broken into two or more pieces but have been skillfully put together again. In other respects they are well preserved. None of our learned men, we understand can yet decipher the hieroglyphics on these tablets, nor do they know the meaning of the figures sculptured upon them. That they have a meaning, no one can doubt, and it is to be hoped they will be studied by some plodding student until a key is found to unlock the whole mystery. The works of Rawlinson and Layard will help them out of the difficulty.

Grooved Crank Motion.



Numerous are the devices that have been invented as substitutes for the crank, for the purpose of converting rectilineal reciprocating into rotary motion and *vice versa*. The accompanying figure does not exhibit a contrivance for this purpose, but it belongs to this class of devices. We present it because it is sent to us almost every month by some amateur in mechanics, as a new invention, whereas it is more than half a century old at least, and we have had a model of it in our possession for eleven years. The object of this device is to give a double motion during each revolution, and which some have supposed would be very well adapted for sawmills.

A is the pitman and B C are two X grooves in the face of a plane wheel or pulley. The pitman is connected to the wheel by pins, E D, at two different points, and these are secured to slides *e d*, in the cross grooves. The dotted lines show different positions of the slides, grooves and pitman, and how the slides move in the grooves according to the positions which they assume as the wheel revolves giving to the pitman its double stroke during each revolution.

The great amount of friction involved by the slides moving in their grooves, renders this device but ill-adapted for the economical operation of machinery.

Steam Pump Fire Engines.

In almost all our cities steam power is rapidly superseding hand labor in the extinguishment of fires. In this particular feature of enterprise our western cities have taken the lead. Cincinnati, Chicago and St. Louis have manifested a most commendable amount of good sense in the adoption of steam fire-engines, as a general means of safety from destructive fires. The report of the Chief Engineer of the Fire Department of the latter city, lately published, presents in a very striking light the advantages of steam over hand fire-engines. The expense of the department for maintaining the steam-engines for one year was $55,000; for the hand engines, $30,000. But on the other hand, the efficiency of the steam *machines* is represented by the small amount of property destroyed in the proportion of $211,623 to $1,300,150, under the old regimé, a saving of more than one million of dollars' worth of property. Our own city is somewhat behind the age on this question; perhaps our firemen consider themselves such high-pressure boiler-bursters as not to require the assistance of steam arms; but if they do not throw off all such notions they will soon find themselves distanced by their Brooklyn brethren. In the Eastern District of the latter city, one of the fire companies has just had a splendid steam machine built, which in a number of respects differs from any other that has yet been brought before the public. It consists of one of Guild & Garrison's powerful steam pumps (illustrated on page 105, Vol. XII., SCIENTIFIC AMERICAN), fitted upon a carriage with a compact vertical tubular boiler, and is the first of the kind which has hitherto been specially applied to such purposes. It is exceedingly compact, and weighs about one-third less than other steam fire-engines of the same capacity. It is of one foot bore and stroke of steam cylinder, and has an 8-inch pump. It has no water-box, and the boiler is fed from the discharge or air-chamber by a small tube—the pressure being sufficient for this purpose, without an extra feed pump. The parts of it, therefore, are few in number, and several trials which have been made with it have given perfect satisfaction as to the rapidity with which the steam can be raised, and the amount of water discharged in a given time. As direct-acting steam pumps are more simple than rotative engines, this new adaptation of them is a question of no ordinary interest.

At the recent conflagration in Boston, by which the Suffolk Flour Mills were destroyed, the "Eclipse," a steam fire-engine, manufactured by Messrs. Silsby, Mynderse & Co., Seneca Falls, N. Y., did good execution, and if the other engine which was brought to the work had operated with equal success, the fire would probably have been extinguished without so great a loss as occurred.

The American Home Garden.

"To those young men and women of the Union who would make their present or prospective homes rich with the comforts, bright with the beauties, and fragrant with the sweets that a garden may be made to yield," Mr. Alexander Watson, of this city, dedicates a very neat and useful volume bearing the above title, of which volume Messrs. Harper & Brothers are the publishers. A home garden, however small, it not only a source of much pleasure, but of some profit also. It is greatly to be lamented that those industrious mechanics and laborers in our cities, who above all other classes would be most benefited with woodbine-clothed cottages and smiling gardens, are just the very persons who are most signally deprived of such enjoyments. A home-garden leads to the elevation of our higher nature—the cultivation of a purer taste, and a higher appreciation of the beautiful in sight and feeling. The pleasure derived from the cultivation of flowers and fruits is exquisite and exhilerating. A sympathy grows up in the human heart for all objects of nature on which care has been be-