

## SAWING, BORING, AND PLANING MACHINE.

The invention we illustrate supplies workers in wood with a useful machine that can be readily adjusted for service either as a scroll saw, a circular saw, a planer, or a boring machine, and which may be run by hand or by power, as desired. Its most important feature is a skilful and effective contrivance by which the speed is multiplied and the power conveyed from the driver to the tool.

The machine is represented in Fig. 1, and Fig. 2 shows, in detail, the peculiar arrangements of pulleys and belting for conveying the power, etc. A is the driving pulley or drum. Bare belts which pass around it, and around the loose pulleys, C. These belts are drawn inward, on opposite sides, as shown in Fig. 2, so as to surround the shaft or small pulley, D, and communicate motion to the same. The loose pulleys, C, run on a shaft attached to the upper ends of two levers, one of which is partly shown in Fig. 2; the lower ends of the levers are connected by a cross-bar, to which is attached a strap that admits of being secured to the frame of the machine, as shown in Fig. 1. By this arrangement the tension of the belts is adjusted. The shaft, D, extends across the frame, and carries at its outer end the fly wheel, E; this is attached by a pin to a connecting rod which gives motion through a crank to the rock shaft, F, the crank being adjusted so that the revolution of the fly wheel only rocks the shaft. This motion of the rock shaft is conveyed through slides to the scroll saw, causing it to make its downward stroke; the recoil is secured by the band, pulleys, and spiral spring seen at the top of the machine.

To the shaft, D, may be attached a circular saw in the ordinary manner, and to its inner end (not shown in the engraving) a cutter head, suitable for light planing or moulding, or a boring tool, may be affixed. The table is provided with gauges, and is adjustable to any elevation required by the character of the work. Our engraving shows both scroll and circular saw attached to the machine, but, in practice, when the scroll saw is used, all the other tools should be detached from the shaft; and when either circular saw, planer, or boring tool is employed, the crank pin of the fly wheel should be detached from the connecting rod, and the operation of the scroll saw prevented. The position of the belts on the pulley or shaft, D, puts equal pressures on opposite sides of the same, and does away with all side strain. Almost the entire periphery of the shaft is in contact with the belts, and a very large surface contact, as compared with the size of the shaft, is obtained. This, and the absence of the usual intermediate belts and pulleys employed for attaining speed, insure the utilization of the power applied and prevent its waste. We are informed that the hand power machine has been employed to saw three inch hard oak felloes and other carriage work with perfect success. It is manufactured extensively by the Greenwich Mowing Machine Company, of Greenwich, N. Y., of whom further information may be obtained.—*Scientific American*.

The Abbé Moigno relates a circumstance which may contain a very valuable hint in relation to the use of cement. A workman employed to repair the steps leading to a garden made use of Portland cement mixed with finely divided cast wrought iron filings and fragments, in place of sand. The result is stated to be that the mass has become so hard as to resist fracture, either with hammer or pickaxes.

The Ottawa Times says:—"We have just seen a model of a patent lately taken out for an Automatic or Self-Coupling Railway Pin, with link designed so as to disconnect should either engine or car run off the track. It entirely does away with the present system of the brakeman risking his life by going between the cars to couple them, and can be unlinked at any moment, even when the train is at full speed, by pulling a string. Had this been in operation, the accident at Belleville could have been to a great degree prevented or mitigated. It has met with approbation so far with the railway officials to whom it has been shown, and from its simplicity and obvious utility, we expect its universal adoption by railways in general.

ANOTHER SUBSTITUTE FOR WOOD ENGRAVING.—Dingler's *Polymechanisches Journal* describes a new process called the "Planotype." The design to be engraved is transferred to a block of lime-tree wood, which is then placed in a machine having somewhat the appearance of a carving machine (the shape of which varies considerably, according to the nature of the work), the graver being kept red hot by a gas-jet. By means of this appliance, the design is gradually burnt into the wood. Figures, or letters of reference, are impressed by means of punches. When the whole design has been burnt into the wood, a cast in type metal is taken direct from the block; without any further preparation, the cast may be used for printing from, like an ordinary stereotype plate. It is stated that the wood does not suffer in the slightest degree from the heat of the molten metal, and that even the finest details are faithfully reproduced. The process is carried out on a large scale and is found to give most satisfactory results.

A NEW OBJECTION TO PATENT LAWS.—It has been our lot from time to time to hear a great many objections, good, bad, and indifferent, against the existence of a patent law, but it could only have occurred to a Scotchman to start what we have lately become familiar with under other circumstances as "the religious difficulty." During the sittings of the late Committee on Patents, Mr. Macfie, the well-known advocate for abolition of patent right, managed on every possible occasion to bore his colleagues on the committee, and to puzzle the witnesses by making a long speech embodying his particular views in the guise of a question. One of the persons under examination happened to use the word "steal" in reference to those persons who used an invention without paying royalty to the inventor. Mr. Macfie was down upon the unfortunate witness in the following manner (Question 2,250): "You use the word 'steal,' but I think God, in his providential arrangements, has so constituted mankind that one receives the benefit of that which another discovers, and I think that the patent laws have a tendency to interfere with those divine arrangements; I look on the patent laws as facilitating a denial to the nations of that which in their absence they would enjoy; do you really think the word 'steal' appropriate?" We have ventured to italicise a portion of this extraordinary "question," which places the matter in an entirely new light. With the fear of Exeter Hall before our eyes, let us remove the foul blot from our statute book without a moment's delay.—*Engineering*.

## CLIMATE AND PHYSIQUE.

"It is the hard grey weather makes hard Englishmen," says Kingsley, and it is difficult to convince an average Englishman that an athletic, or martial, or industrious race can grow up under a blazing sun, or the sweet soft air of the half-heated lands, amidst the heat of the tropics, or in any climate so perfect that it suffices by itself to supply the need of enjoyment. The notion that man flourishes best in a temperate climate survives all evidence to the contrary, and will be repeated with perfect coolness by the man who has just informed you that the two most perfect of earthly climates, the Tasmanian, which is the English climate etherealized, and the Californian, which is the Greek climate cooled, produce the two feeblest races of mankind. The native Tasmanian and the Digger Indian are, with the Vedda, the lowest specimens of humanity hitherto observed. So far as the very imperfect evidence will prove, the physical qualities, strength, size, courage, and perhaps industry—we doubt if that is a physical quality, but it is counted as one—are independent of the climate altogether, and specially independent of the thermometer. The biggest and strongest race on earth, the Nubian of the Upper Nile, flourishes in a heat which almost boiled Werne, the traveller, who has most carefully observed his wonderful muscular development, and can live and grow fat in stoke-rooms from which the most powerful Englishmen are carried out fainting and half dead. Kaiser William's Pomeranians are scarcely the equals of these men in physique, and are not, when they choose, more steadily industrious. A *humai* of Constantinople or Cairo would carry a railway porter on his shoulders and all his luggage besides, and a Bengalee boatman would row a London water-man, as far as endurance is concerned, into an apoplectic fit. The Bengalee is weak and the Peguan is not brave, but the Malay, born under precisely the same conditions, the very conditions to which Macaulay attributed the effeminacy of the Bengalees, has the courage of a ferret, the activity of a monkey, and the endurance of a thoroughbred horse. Some day or other, when we reign in Cairo, Englishmen will officer an army of Arabs, men bred in a desert where the sun seems to hate human beings and pursue them with a kind of conscious pitilessness, and then Asia will know once more why the Moor seemed to the mailed knights of France and Spain so terrible an enemy. Few human beings are so powerful as the Parsees, whose wrestlers defeat picked men from the British Army, and they have dwelt for ages in a climate to which that of Italy is cold, and for two centuries in Western India, and none are so industrious as the Chinese of the South, the men of those steaming superheated Deltas where the earth being water, the men, on the popular theory, should be women. The Peruvian is a soft creature, but his climate is cooler than that of the regions of Panama and Guiana, where the bravest and fiercest of aborigines, the Carib, still maintains his hereditary freedom.

Out of the "softly enervating climate," as we Northerners deem it, of Central Italy came the sternest, bravest, and most efficient human being that ever walked the world, the fighting Roman patrician, who, after a thousand years of heat and luxury, and sated voluptuousness, was still the most formidable officer with whom an enemy could come in contact; and he was outdone in courage by the men who swarmed up from the blazing slopes of Palestine and the fierce heat of the Idumea to defend the Holy City. The Scotch and Swedes are confessedly manly people, able to toil, and to battle, and to endure; but they are not manlier, or braver, or more enduring than the planters bred in those sweltering rice swamps of South Carolina, or the hot "barrens" of Georgia, or the hotter lagoons and morasses and flooded jungles of Louisiana, where upon all accepted conditions men ought to degenerate into cowards. The Delawarees, bred in a temperate climate, were not braver than the Seminoles of Florida, or so brave as their far-away kinsfolk the Caribs of Panama; and the negro transported out of the tropics distinctly loses nerve. We think that heat demoralizes, but when Spain anticipated Britain and conquered and colonized a continent, when three hundred Spanish ruffians, led by a brutal pig-jobber, trampled down a semi-civilized empire with millions of inhabitants, Spain was as hot as it is now. We speak of the exceptional prolificness of the Anglo-Saxon, who is now sending an army of 100,000 men a year to people America and the Southern Continent, and never feels the loss; but who peopled India and Southern China, and the southern shore of the Mediterranean, and Spanish America, except races who must have lived for ages under the sun? It was not under hard grey weather that the Temple of the Sun rose in Baalbec, or the columns of Luxor, or the Coliseum, monuments all of them of human industry as well as of human skill and dominating energy. Grant that the work was done by slaves, it is not by the feeble that slaves are held in slavery.

But that force which is the cause of progress, that energy which is always advancing, is peculiar to the people of the hard, but temperate climes? Is it? Is England hotter to the peasant than to the proprietor, and how much has the peasant changed since villenage was abolished? Was Greece cooler while Athens rose than when Athens fell? If our civilization goes on for ever advancing, there may be evidence that climate is a condition of progress; but where is the proof that it will go on longer than the Chinese, which must have advanced steadily for centuries, and is now stationary or retrograde? or than that of Egypt, or than that of Upper India, where well-known arts have utterly died out? It may of course advance continuously, but it is a pure assumption that it will, that there is any element of progress in the Northern climates which the Southern do not possess, any source of force in the hard grey weather which there is not in the heat of Asia, or in the eternal summer of the Mediterranean border lands.—*Spectator*.

Any organ of the human structure unduly exercised is taxed at the expense of the rest.

The brain burdened with care, grief or hard study, will withdraw a portion of the nervous element, which may be required to promote healthy muscular action from the heart, lungs, stomach, etc., and thus cause them to degenerate and to become incompetent to perform their duties, so that disease follows.

Consequently, although Fellows' Compound Syrup of Hypophosphites will surely cure many diseases of these organs, patients must abstain from excessive indulgences or such habits as cause or perpetuate the malady, if they would remain healthy after discontinuing its use.

## MISCELLANEOUS.

A Pharmaceutical Congress is to be held in Paris in October.

The Prussian Government publicly calls attention to the presence of trichinae in hams imported via Bremen from the United States, warning purchasers to abstain from them, and threatening the sellers with criminal proceedings.

The Corporation of London have decided to have a medal struck in commemoration of the Thanksgiving in honour of the Prince of Wales. The cost is not to exceed \$5,625, and copies of the medal will be presented to the Royal family, and to museums and literary institutions at home and abroad.

Lord Vernon has suggested a compromise on the Athanasian Creed question. He thinks that on the holy days on which the use of the Creed is directed in the Rubric, a special service might be held at which the Creed could be repeated by those who support its use. In the ordinary morning service it could be omitted.

At the Halles Centrales in Paris is an out-of-the-way shop having for a signboard "The Changed Chemise." The man who wants a change of linen puts down half a franc, and darts behind a screen. A colloquy ensues between client and shopkeeper as to the largeness of neck and length of arms; finally, a white chemise is tossed over the screen, and the member of the sovereign people departs in due course, leaving his soiled garment behind.

The Prince Imperial of France, who has obtained the Queen's permission to become a student at the Royal Military Academy, Woolwich, will join at the beginning of next term for the usual course of instruction. As his admission will be under an order from Her Majesty, it will not be necessary for the Prince to pass the usual preliminary examination, which was dispensed with in the case of Prince Arthur and all who join as Queen's cadets.

There is a new summer resort—refreshing in its very name—Iceland. A line of steamships has been established to run "summer ships" from Granton, Scotland, to Iceland, and the screw steamship "Queen" completed her first voyage on June 15, eleven days after leaving the Firth on her outward passage. The voyage out took exactly four days, and the return home occupied a few hours longer. The passengers seem to have been much pleased with their expedition.

*L'Evenement* has the following paragraph:—Sir Colin Campbell, the conqueror of the Indian insurrection in 1858, who has been created a lord, and also an Earl of Schwesbury, on account of his good services, is shortly to go to Canada as Viceroy. Lord Schwesbury, who was one of the youngest general officers of the army of 1858, is now only fifty-four years of age. He is, as his name indicates, of Scotch origin, and belongs to the Clan of Campbell Mac-Campbell.

The bronze statue of Lincoln, to be erected over his remains at Springfield, Illinois, has been executed by Mr. S. Mossman, at the Ames Works, in Chicopee, Massachusetts. The height of the statue is eleven feet, and it represents Mr. Lincoln in citizen's dress, standing at rest, with his right hand (still holding the pen with which he has just signed the emancipation proclamation) resting upon the Roman fasces, over the top of which is carelessly thrown the American flag. Beside the fasces lies a laurel wreath. The left hand is slightly extended, grasping the roll which gives liberty to three and a half million slaves.

The Berlin *Volk's Zeitung* applies to the Pope the curious arithmetical game which has come into fashion in Germany since the late war; namely, of tracing a mysterious connection between dates and the events making them memorable, and deducing thence a prophecy. By comparing the dates of special significance in the life of Pius IX. the Berlin paper has discovered that the figures of each sum up to 19. Thus Mastai Ferretti was born in 1792, he was ordained in 1813, chosen Pope in 1846. The next year distinguished by the same peculiarity is 1873, when consequently the progressist journal concludes some great event will again happen to him. What this is to be it leaves its readers to imagine.

Drowned in corn is a singular as well as a melancholy fate, and befell a merchant at Peru, Ill. Charles Hoffman was loading a car of corn, and had his arm inside the car tripping it. The man noticed that the corn had nearly ceased to run, and on going to see the cause, found that Hoffman's son, aged eleven years, was at the mouth, and learned from the other boys that he had been drawn down from the top. Mr. Hoffman ran to the rescue, and, jumping in, ordered the other sports to be opened, having probably found it impossible to draw out the boy. But the opening being too small he was himself drawn under, and suffocated before the bin was emptied. Life was extinct in both when taken out.

TAME PARTRIDGES.—Captain Dawson, of this town, the past season found a nest of partridge eggs in the woods which he brought home and placed under a hen. She hatched out ten little chicks, four of which she accidentally trampled to death, and two were killed by the cat. Four, however, are growing nicely, their tails and crests being well developed. They are tamer than young domesticated chickens generally are, ramble through the garden, go into the house, pick crumbs off the table, and will even sit and pick food off a person's hand. At night they go to roost in their "house" as old fashioned as possible. They bid fair to be thoroughly domesticated. We doubt if the history of the Province can furnish another such instance of successful partridge taming.—*Eastern Chronicle, New Glasgow, N. S.*

The following anecdote is now going the rounds:—An officer who was ordered on duty from one station to another, in his travelling claim inserted the item "Porter, 6d." This was struck out by the War Office. The officer wrote back stating that the porter named had conveyed his baggage from one station to another, and he would otherwise have had to make use of a cab, which would have cost 1s. 6d. In answer to this he received "an official," stating that under those circumstances his claim would be allowed, but that he should have used the term "portage" instead of "porter." He being unable, we presume, to resist the temptation that seized him, answered to the effect that, although he could not discover a precedent for the use of the word "portage," he would, nevertheless, do as he was told, and wished to know whether he should use the term "cab(b)age" when he meant "cab?" The result, we hear, was a severe reprimand from the War Office. He had his joke at its expense—not the first that the petty economy of the present Government has called forth.—*Court Journal*.