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IMPROVED REBOLTING MACHINE.

Rattan.

A Great Flour Mill,

Glasgow has long been noted for the number and improved The invention herewith illustrated is a sawing apparatus, Rattan comes from the East Indies, principally from Sincontrived for rebolting large bolts of timber without quite gapore, Pedang, Penang, Samarang, and St. Simon's Bay. The structural and mechanical arrangements of its flour mills, separating the smaller bolts from each other, so that they and Messrs. John Tod & Co. have just erected in the Govan United States consumes three quarters of the total product, will hold together, admitting of handling or dogging in the the imports amounting now to something more than 6,000,000 road a new mill, which, so far as grinding power is conshingling or other machine, in which they are to be finally pounds. The Calamus Rotang belongs to that peculiar spec- cerned, is second to none in the great port of the Clyde. Al-

cut up. By this means the machine may be supplied with timber to its full working capacity, while, at the same time, cutting the shingles or other pieces as narrow as desired.

In the perspective view, Fig. 1, A is the carriage which moves under the saw, B. The depth of the carriage under the blade is such that the latter does not reach the bottom, so that the bolt, secured in saw carriage, will not be cut entirely through. This will be understood from the sectional view, Fig. 2, in which the bolt is represented by dotted lines, D. C is a tilting rest for the bolt, upon which the sap side of the latter, generally bevel to the other sides, is placed, and held so that the saw kerf will pass down to the axis of the rest, thus leaving sufficient wood to hold the portions together, no matter how much the bottom may be inclined as regards the sides.

At E is a pair of clamps which work upon right and left hand screws, F, Fig. 2, and are operated by the crank, G, Fig. 1. These serve to hold the bolts securely while being cut. A portion of the carriage, H, is elevated, in order to accommodate pieces which are to be divided entirely, as in ordinary sawing machines. The track of the carriage is made in two portions, one above the other, so that the upper part can be vertically adjusted as

wears away.

Patent pending through the Scientific American Patent Agency. For further particulars address W. A. Fletcher, Beaumont, Jefferson county, Texas. ---

THE COMBINATION FOOT LATHE.

For the use of amateurs, and for mechanics who desire to economize both in the cost of, as well as in the space occupied by, their tools, the novel device herewith illustrated rattan is made up into some half dozen different sizes, and weights are set in its upper surface, so fitted that by the mowill be found of much utility. It is a simple foot lathe, with which are combined a jig and a circular saw.

The former, which is represented on the right of the machine, is actuated by a pitman which connects eccentrically with the end of a shaft, A, passing under the apparatus. Motion is communicated to this shaft by a separate belt from the main pulley. The pitman operates a pivoted lever which, by an adjustable connection, B, transmits its motion to the saw arm. The saw works through a suitable table, and is tightened by a set screw in the connection, B. We are informed that it penetrates timber an inch and a half in thickness with perfect readiness.

At the opposite end of the lathe. and at. tached to the main arbor, is a small circular saw. This has an adjustable table which is provided with the usual guides, etc. By turning back the table, and removing the saw, an emery or buffing wheel may be substituted in its place upon the arbor. Regarding the lathe itself, other than to notice that it is neatly and substantially built, and appears to be an efficient and reliable tool, no particular description is needed.



FLETCHER'S REBOLTING MACHINE.

ish, when stripped off by particular machinery, is used for



been exercised in the erection of the building so as to prevent the origin and spread of fire, the grinding machinery is of the most complete description. By means of telescopicpipes, for instance, passing down to every floor, it is possible, should the wheat get out of order at any time by overheating or otherwise, to shift it from one floor to the other. Another interesting arrange. ment is one by which the central portion of the store may be converted into a hopper from top to bottom, communication being easily made with all the elevators and screws in the store, which itself is so substantially constructed that it would be perfectly safe, although filled quite solid with grain. With regard to the cleaning machinery, the grain enters, by means of a hopper, into the wheat separator, in which the accidental grains of Indian corn and straw, and the greater portion of dirt accompanying the wheat, are removed from it. The scrubber is a machine of complicated construction, which next removes the feather end of the grain and a large portion of the bran. The wheat is then conveyed by a spout to an elevator, which takes it to the top story of the mill. Of the twenty five pairs of millstones which it is intended

together, apart from the care which has

may be required, for saws of different sizes, or as the blade ies of palm which secretes in its cuticle a very considerable to introduce, twelve are erected and in operation. The amount of silica, while its inside is made up of tough and stones are each 4 feet 3 inches in diameter by 12 inches thick, fibrous filaments. The outside with the smooth natural varn- and the cost is about \$150. They are made of French burr, an interesting and not very common form of silica, of a celseating chairs. The inside of the rattan is employed in a lular texture, which, for industrial purposes, is almost envariety of ways. It is shaped by machinery either round or flat, | tirely derived from the mineral basin of Paris and a few adand so worked up into innumerable articles. Baskets, brooms, joining districts. Considerable care and skill are required mats, matting, are all made from the inside of the rattan, and in their preparation. The revolving stone usually makes an immense quantity of it is worked around demijohns. Split about 120 revolutions per minute. Four movable balance

> tion of a screw the stone can be made to lie perfectly level when in motion, this being a most esgential condition in good grinding. The opposite surfaces of the stones, from the peculiarity of their dressing, act upon the grain like the blades of a pair of scissors. The white meal, being carried to the uppermost floor, enters a cooler, which is a circular vessel, about 9 feet in diameter, and about 27 inches high, the sides being formed of galvanized sheet iron. There is a vertical spindle in the center, and at the bottom of this a horizontal arm provided with twelve wooden blades, so set that they spread the meal as evenly as possible, and gradually move it out to the circumference of the cooler. At one part of the latter, there is a hopper opening into a spout, by which the meal is conveyed to the floor below, where it is subjected to the first dressing process, the object of which is to separate the bran. The dressing machine may be described generally as a large wooden case, in which revolves horizontally a sixsided framework of wood, having a peculiar kind of silk fabric stretched over it. Inside the silk covered framework there are a number of wooden blades set obliquely, so as to carry the bran forward to the further end of the machine, the coarse dressed flour meanwhile passing through the silk into the screw elevator, which conveys it to another cooler in the floor above. There are four of these coolers, all in the fifth or upper floor of the mill. Messrs. Tod & Co. are also preparing to erect, in addi-

The apparatus is manufactured by Strange's Cylinder Saw Machine Company, of Taunton, Mass. For further particulars address O. W. Leonard, sole agent-40 John street, New York city. Patent now pending.

IRON HAIL -Professor Eversman has had occasion to examine, at Kasan, hallstones containing crystalized iron pyrites. The cause of this rare phenomenon, no doubt, was that small crystals of pyrites, proceeding from the disintegration of a rock, had been transported by a tempest into the clouds, where they were iced and converted into hailstones.

-

THE COMBINATION FOOT LATHE.

are used by whip makers. This large and constantly increas ing business may be estimated by the fact that one factory in New England alone employs 1,000 operatives, and that the total number of people working in rattan (the schoolmasters ture of rattan is about \$2,000,000.

is then sold by the 1,000 feet. The finest qualities of rattan | tion to the grinding stones, a number of steel rollers, similar to those used in the mills of Hungary for the production of that superior class of flour known in the trade as Hungarian whites. When the mill, as at present designed, is complete, the making power will not be less than 3,000 sacks excluded) is fully 1,800. The capital used in the manufac- per week. The steam power for these varied operations is generated in a pair of horizontal multitubular boilers, 12

feet long by 16 feet in diameter, working to a pressure of 70 lbs. per square inch, and supplied by Messrs. Lees, Anderson & Co, Ciyde street, Anderston: the pair of fine engiaes by which the machinery is driven have also been supplied by the same firm, and are diagonal compound high pressure, both high and low pressure cylinders working on the same crank pin. The high pressure cylinder is 16 inches in diameter, that of the low pressure cylinder being 24 inches, and length of stroke 30 inches. In the former there is an expansion valve so arranged as to cut off the stroke at any point, from 5 inches to 20 inches, and which can be varied at will while the engines are working at full speed. They are regulated by Scott's Moncrieff patent governor. There will also be a small engine for the hoisting machinery in the grain store, and working separately. The architect of system of domestic economy. It is possible that, to their the building is Mr. W. Spence; while Mr. W. Young, flour mill engineer, has constructed and superintended the erection of all the varied and complicated mechanism of store and mill, with the exception of the engines, boilers, and millstones. Mr. Young's new cooler has been adopted here for the first time.

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THE LIGHT OF COMING DAYS.

Every tyro in optics knows that light is the most tractable of material effects. It is obedient to the last degree. You can send it where you will, to any distance, through the crookedest channels, through the darkest passages, and it will emerge undimmed, ready to be absorbed or dispersed as the operator may wish.

It is well known also that there are many ways of producing a brilliant light, much more easily and economically than by carbon combustion in small and scattered flames. Yet, curiously, this familiar knowledge does not appear to have ever been put to practical use in producing a simple, wholesome, agreeable, scientific illumination for public and private buildings. To our children, the old fashioned candle snuffers are unknown, or known only as relics of an antiquated children, gas pipes may be equally obsolete as articles of household use, light tubes furnished with reflectors and terminal radiators taking their place.

The working of the predicted system can be sketched in few words. Given, say, a large hotel to be furnished with artificial light: Instead of having a network of gas pipes leading to the different rooms and to different burners in each room, according to the present method, the light for the entire building would be generated in one place, say in the main ventilating shaft for the utilizing of the surplus heat. The distribution of the light would be effected by means of reflectors, each throwing into its appropriate tube a bundle of rays (made parallel by a lens) sufficiently intense to radiance, which could be turned on or off or graduated by simply pressing a knob or turning a key. In size, the light tubes be much smaller, since all the light required for the largest room might be transmitted to the reflector as an extremely slender beam. The terminal lenses would close the tube sgainst smoke and dust, which would dim the reflectors at the angles; and by keeping the enclosed air pure and dry, the absorption of light would be inappreciable.

The advantages of this mode of illumination are many and obvious. There would be no poisoning of the a.mosphere by local combustion; no scattered flames to occasion fires; no circulation of combustible material to encourage fire, should it happen to break out; children and careless servants would have nothing to handle that could possibly do damage; there would be no misplaced heat; no smoke or odor to sicken or annoy; no cross lights or flickerings to hurt the eyes. Besides, the lighting of a housewould help to purify its atmosphere, instead of vitiating it as now, if the source of light were placed, as we have suggested, in the ventilating shaft; and, very likely, the economy of the light would be such that means for the instantaneous illumination of the entire house could be maintained at all hours of the night without costing more than our presentimperfect and partial lighting does.

For churches, theaters, and other places of public resort, this method of lighting is specially available and inviting. The source of light might be in an absolutely fireproof vault or chamber, or in a separate building, so that the danger of accidental fires, with their attendant evile, would be reduced to the minimum. Similar advantages would attend its application to sbipping. For mines, especially coal mines, it is unapproachable for simplicity and safety. Smoky torches and treacherous "safety lamps" might be entirely abolished, and the deepest pits flooded with white light, without flame tor he shadow of a risk of explosion.

A CHANCE FOR INVENTORS.

While there is reason to doubt the possibility of devising an electric motor capable of doing heavy work as economically as the steam engine, there can be no question that, for light service, a satisfactory electric engine is one of the most widely felt needs of the age.

All that is lacking to meet this want is a suitable battery; in other words, a simple, compact, portable; and, if possible, dry apparatus, capable of generating a steady current of electricity for a considerable period without renewal, capable of standing unused without material waste, yet able to give out its full power on the instant when required, capable of being easily and cheaply kept in working order, free from fumes, and not liable to leak or spill its contents under ordinary circumstances.

The applications which await such a battery are practically innumerable.

Even with the fuming, slopping, troublesome batteries Mayor or Council, no assessments for street improvements, already in use, enough has been accomplished with electric no taxes for water and gas, no entangling alliances or iseu-The light of other days-practical, not poetic-was the motors to demonstrate the superiority of electricity for light ing of bonds to secure railroad transportation, no scrambling tallow dip, and, further back, a bunch of moss in a dish of work. Everything that steam can do in such cases it can do; grease. The advance from this primitive illuminator to the and there are many occasions, domestic and otherwise, where steam power cannot be conveniently employed, where a small electric engine might do the required work quickly, neatly, without heat or risk of explosion, and without calling for special engineering skill or knowledge, the common lack of Before we can truly say that our streets and houses are steam for household service. And though the power ob- ings. Work upon this remarkable town, to which the name lighted scientifically, another and more important advance | tained may be in itself, many times more expensive than an equivalent amount of steam power, the advantages attending the use of electricity are so pronounced, the possible saving of time and trouble so great, that, with a generator such as we have described, there would be no hesitation in giving it the preference in thousands of cases where a little rower is wanted for continuous work, or where there is occasional need of a small but instant effect. Take, for example, that almost universal household neces The popular mistake lies in supposing that the light must sity, the sewing machine. How immensely would its usefulnecessarily be generated where it is used. The remoteness, ness be increased by an acceptable means of running it; a of our natural illuminators ought to teach us the absurdity motor which would require no winding up, which would not easily get out of order, which would be always safe, always

ready, and perfectly under control! A man who should devise a battery to meet this demand alone would be sure of a fortune.

But this is only one of a countless number of uses to which such a battery might be put.

In almost every civilized home, there is water to pump, washing machines to operate, wood to saw, coal to lift, and a multitude of other labors, all of which might be done advantageously by simple electric motors, provided the requisite battery were forthcoming. B-sides, there is light to furnish, doors and windows to guard against burglars, errands to run, and accidental fires to report. It is not impossible that the common dwelling house of the future will rival Houdan's in the diversity and completeness of its electrical appliances; yet, without entering the region of speculation or looking beyond the simple daily needs of ordinary households, there is a present call for the services of this fleetest, neatest, and most tractable of servants, sufficient to ensure wealth and renown to whoever shall capture and harness him satisfactorily.

For light manufacturing purposes, the call is equally urgent. In every workshop where steam is not used, there are presses, saws, lathes, drills, and numberless other present or possible machines, to which electro motors might be profitably applied. For amateur workmon, nothing could be more desirable or more likely to meet with immediate acceptance. Then what an admirable contrivance it would be for driving light wagons or propelling pleasure boats! flood the room to which they were directed with a pure white There would be no fuel to carry, no fire to watch, no possible explosion to fear: there would be no stabling or grooming to pay for, and no food to buy for the hours of idleness. Mr. need be no greater than ordinary gas pipes. Indeed they might Bergh ought to offer a premium for the invention, simply for the sake of the animals he loves.

> Where the range of application is so great, it is needless to multiply examples. Our purpose is to suggest, not to demonstrate, the multitudinous uses to which a satisfactory electro motor may be put, and to call the attention of inventors to the certain reward that will come to whoever shall overcome the last remaining obstacle.

. . . . A CITY BUILT BY ONE MAN.

History affords numerous instances of the foundation of cities by single individuals, and the beautification and enlargement of portions of the same through the munificence of others; but nowhere, as we believe, is it recorded that any one man from his private fortune has ever attempted the actual construction of a complete town. All the more remarkable, therefore, is the enterprize which for some five years past has been quietly pursued by Mr. A. T. Stewart. a gentleman of whose immense wealth no accurate information has ever been made public. The high rates of taxation and the consequent exproitant rents incident to ownership and occupation of dwellings in New York city have been the means of virtually banishing a large number of persons doing business therein, whose moderate incomes forbid the necessary expenditure, to the adjacent suburban districts. Hence arose a great demand for cheap homes; and as a result, village after village has sprung into existence in Long Island, New Jersey, and in fact at every point within a radius of forty miles of the metropolis.

Mr. Stewart, in view of this constant exodus of the city population, conceived the unique idea of building a model suburban city, where comfortable homes, provided with all modern improvements, could be obtained for a moderate outlay. Accordingly, he purchased a plot of land, ten thousand acres in extent and embracing that portion of Long Island known as Hempstead Plains. This is in a compact tract of about ten miles in length by one mile in width, and nearly a perfect parallelogram in shape. Surveying and staking out the new city followed close upon the acquisition of the ground, and the first work taken in hand was the making of streets and avenues, with pavemente, sewers, culverts and conduits, for blocks of buildings yet to be crected. Simultaneous with laying the foundations of the houses, was the commencement of gas and water works, and of a reilroad connecting the city with New York. Unlike the usual course adopted in projecting new towns in the vicinity of the metropolis, no lots were advertised; ror has any attempt been made to dispose of the property, as it is the intention to treat the city as a single house, finishing it first, and selling it subsequently. The New York Sun aptly describes the enterprize as a new city springing up, with no

gas jet covers a most important stage in the progress of domestic ecoromy. To make the illuminating material distribute itself was a capital strcke of policy. By most people it is regarded as the figal stroke in the conflict with the shades of night. But it falls very far short of it.

must be made. We must get rid of the offensive and poisonous products, the heat and flickering, the sharp contrasts of light and shade, the needless expense and frequent fires, and the thousand other disadvantages attending the distri bution and local combustion of our illuminating material, by distributing instead pure light.

The problem is simple and easily solved. What we want in our rorms is a clean, white light, like diffused daylight. of such a position.

or grumbling to secure immigrants.

An admirably kept hotel, situated in the middle of a fine garden plot, together with some forty houses, are thus far complete. The latter are located in lots of 200x200 feet and provided with outhouses and handsomely laid out grounds. They rent for from \$250 to \$300 per year on three year leases, which must ever act as a bar to the general employment of and contain every convenience found in the best city dwellof Garden City has been given, is rapidly progressing, and we understand that the advantages offered are meeting with a wide popular appreciation.

> GERMAN RAILWAYS.-It appears that, in consequence of the increased cost of railway working in Germany, as well as in other parts of the world, the rate of interest realized. on the capital expended on first establishment account, declined last year to 4.4 per cent. In 1869, the corresponding return stood at 64 per cent. An augmentation of 16 per cent in goods rates is required in order to secure an average interest of $5\frac{1}{2}$ per cent on the capital expended.