A BIG FLOUR MILL.

A recent number of the Boston *Journal of Commerce* contains an account of the mammoth flouring mill now nearly completed, in the city of Minneapolis, Minn., from which we call the following particulars. The owners are C. A. Pillsbury & Co., who also own the five principal mills of the city:—

Some two and a half years since Mr. Pillsbury visited Europe with a view of examining the various mill buildings and processes relating to the manufacture of flour in the various milling centres. After his return a site was selected on the east side of the river, about 600 feet below the falls of St. Anthony, the plans of the building agreed upon, and the drawings made. In the spring of 1880 ground was broken and the structure commenced. It is built from Trenton limestone, rock faced, and laid in courses. The *building is 1,800 feet long*, 115 feet wide, and 137 feet high, having seven stories and a cupola. The side walls at the foundation are 8½ feet thick and at each end the walls are 7½ feet thick. The walls of the building proper are 5½ feet thick below the grinding floor, and taper to a thickness of 2½ feet in the three highest stories. The basement is 20 feet in height, laid in Louisville cement, and the coping, window sills, and two bolting courses are of hammered granite. The outside of the building shows for itself elegance of design which is quite appropriate for the purposes to which it is applied. The masonry of this building alone required 125 men nearly six months to finish. The driving mechanism is found on the first or basement floor. There is also a wheat bin capable of holding 35,000 bushels of wheat, extending up through the grinding floor. The Hurst frames for the millstones are on this floor, but the millstones are on the floor above. The second story is the reducing floor, and when the machinery for the mill is completed, 400 sets of roller mills will be here, arranged in twelve lines. Only half of the machinery has been placed. One hundred and one Gray's mills have been furnished. All these machines are double roller, 18×9 inches in size. Sixty-four corrugated machines, 27 smooth roller machines, and 10 porcelain machines. There are 115 Stevens' roller mills, and there will be twenty *pairs of millstones in the* whole mill which will be used on middlings. The millstones are arranged in one line against the north wall of this story, and are elegantly fitted in black walnut and ash, and are all provided with Behrus patent high pressure millstone ventilation. There is also a weighing hopper and scales upon this floor, the hopper holding 800 bushels. There is also a line shaft, 120 feet in length, from which the power to drive the flour packers on the floor above is taken. The third room is the packing room, where, on each side of the mill, will be placed, when the second half of the mill is finished, 12 Eureka flour packers, making 24 in all. One end of this floor is partitioned off for a cleaning room, and this is driven by a separate belt. A large part of the floor is taken up with storage bins, but plenty of room is left for handling the flour after it is packed. On the fourth floor the bolting chests begin and run up to the attic. In the eastern half of the mill, the half now running, there are eight double and four single chests, which on the three floors above contain 40 reels each, and on the fourth floor above 22 reels, making 142 reels in all, each 14 feet long. Twenty three No. 2 Smith purifiers are also upon this floor. There are also bins over the flour packers on the floor below, made out of boiler iron six feet in diameter, extending through two stories. In the end of this story, set apart for wheat cleaning *like the floor below, there are four Richmond* brush machines, and two large sized Kurth-Coccle separators; also four Niagara bran dusters. The fifth floor is a continuation of the bolting chests, also four brush machines, four separators and two centrifugal flour bolters, bran dusters, smutter, brush machines, and dust catchers.

The mill has ample facilities for receiving grain and shipping flour, which facilities are absolutely necessary when the fact is stated that 25,000 bushels of wheat will be ground every day this mill runs when all the machinery is put in. The mill is supplied with an elevator for passengers and freight, and is lighted with the Brush electric light of 32,000 candle power. The steam for heating the building is supplied by two steel boilers, placed in a fire proof building, separate from the mill; electric call bells are on every floor, and the mill has telephonic connection with Minneapolis, St. Paul, and Stillwater. A central stairway, built of iron, which is spiral in form, is one of the noticeable features. The interior of the mill is painted white, with red trimmings, while the roll mills, stairways and scales are painted red.

The power for this mill is one of the noticeable features, as well as one of the absolute requirements. The forebay is in the basement, is 125 feet long, 15 feet wide, built of stone, and laid in hydraulic cement. The wheel pits are dug out of a solid ledge, and are 57 feet deep, being walled in by solid masonry. Iron flumes, 12 feet in diameter, made of ⅜ inch boiler iron, are used inside the pits. The motive power is two Victor wheels, 55 inches in diameter. The two wheels yield 2,400 horse-power, according to careful measurements, and it is said to be the largest power developed by any two wheels in the world. The water is brought to the mill by means of a canal 556 feet long, 16 feet wide, and 16 feet in depth, in solid rock. After the rock was blasted out the sides were built up with solid masonry laid in hydraulic cement and arched over with stone. The bulkhead is 30 feet wide, 30 feet high, and in it are two gates, one on each side of a central pier. A stone arch beneath the basement admits the water into the mill. The discharge from the wheels is through two tunnels, each 150 feet in length, running from the river to the mill directly under the wheels. The tunnels empty into a tail race several hundred feet long, which empties into the river. Upon the top of each water-wheel shaft is a bevel gear which transmits the power to a horizontal shaft eight inches in diameter, 145 feet long, tapering to six inches at the end, which rests on a solid archwork of masonry inside the forebay. On this line of shaft are the driving pulleys, weighing each six and one-half tons, and upon which run two 48-inch belts, each 26 feet long and double. From the line of shaft the power is taken off by thirty inch belts, to drive the various machines of the mill The arrangement is such that if one wheel should break the other can run the mill, and the power of both wheels can be used together on each or both sides.

One half of this mill is now built, and is considered capable of turning out 2,500 barrels of flour per day; but it has made, by actual record, 3,547 barrels in one day. The mill, when completed, will have a capacity of 5,000 barrels per day, making, it is claimed, the largest flour mill in the world. The amount of power yielded by the two mills in question is something which can hardly be measured, by the mind, at least; and that a water wheel, 55 inches in diameter, should be enabled to transmit 1,200 horse-power, is applying a large amount of power, which, in this case, seems to be thoroughly utilized. We have never before heard of a water wheel transmitting 1,200 horse power, let alone two working in the same pit actually yielding, or ready to yield, 2,400 horse-power.

Some conception of the capacity of this mill may be had when it is stated that 125 cars are required daily to take the total production of the mill away, and sometimes 200 cars arriving and departing to do the business of this mill.

Dangers of the Electric Light.

It is reported that the disastrous fire at the Landenberger Mill, Philadelphia, on Wednesday night, had its origin, as the local journals express it, in the "unaccountable flickerings and sparks from the electric lights used in the establishment." If these statements be correct, it becomes a matter of no inconsiderable importance to ascertain from the scientists how far these eccentricities are likely to be permanent conditions of the use of these lights in other establishments. It is a serious business thus to have life and property at the mercy of their scintillations.—*Philadelphia Bulletin.*

There is more or less danger of the falling of sparks from all electric lights. Any imperfection in the carbon or irregularity in the driving engine will produce snappping and sparking. A simple safeguard is to place a glass cup around or under the carbon to catch the sparks.—*Scientific American.*

OFF FOR THE WOODS.

Probably at a thousand towns there are men now waiting for transportation to the camps, or hanging around looking for jobs. They are not burdened with Saratoga trunks, and few of them have oven white shirts. Their days are merry ones, when they are sojourning in places of civilization, and after they shall have all departed the saloon keeper will detect a material decrease in his receipts. It would be strange if at some places special policemen have not been appointed to hold in check the strangers who are stopping among them. It would be somewhat out of the natural order of events if some of these strangers have not slept in the calaboose over night, and perhaps occasionally one of them has asked a citizen for a little money to enable him to pay his board bill for a day or two longer or until he can find work. These favors, however, are never asked as a gift, but are accompanied by a promise that the money will be returned immediately after the first pay day, and it might be possible to find better dressed, and more polished men who would not remember their debts as well.

We do not infer by this description that these loggers are really bad men. Many a good man has worn a woollen shirt, and been able to carry his entire wardrobe in a big handkerchief. Noble-hearted fellows, many of them are, who would share their last dollar with a companion disabled by a falling tree, or prostrated by sickness in camp, and the hat that is passed among them for a suffering comrade would often make the contribution plate, that circles around many an elegant church for the cause of charity, look mighty sick. The men in the woods will swear at one another, fight often, and are always ready to beat his fellow workman out of his last cent at poker, but when it comes to helping the unfortunate, their hearts are in the right place.

The majority of the men who go into the pineries do not leave behind them pleasant homes. In fact, many of them are homeless, and, virtually, wanderers - in the mills in summer, on the drives in the spring, and in the woods in the winter. They float from Maine to Canada, and from Canada to the Northwest, ready at any season to travel in any direction where inclination or a promise of increased pay may lead them. They can wield an axe, "yank" a saw, flourish an ox-gad, or hold a pair of reins, and feel that these qualifications will earn them a living anywhere in the lumber regions. Their stock in trade is easily carried, and they tramp, tramp, but always with an object in view.

The dangers of a camp are many. The giants of the forest will crush many a man the coming winter under their heavy bodies and spreading wings, as they go down before the axe that year after year is cutting them away. The treacherous binder will sweep scores of drivers from their loads into eternity, and often, when loading and unloading, a log will roll over the man or men in its way, breaking limbs or destroying life. The axe will go amiss, and, instead of being imbedded in the wood, will strike some poor fellow standing in its course. The men are subjected to these dangers, and others as well. The wages they obtain would be little inducement for others than habitual woodsmen to chance the risk, but they go into the woods in a mood that tells little of a thought that before the season shall end some of them, maimed, will, with blankets thrown over them, be carried to the nearest hospital, and the bodies of others drawn on ox sleds to the nearest settlement, and thence forwarded to their friends, or buried in graves that will never be wept over, or even sought. They probably think little of this phase of the life they are entering upon afresh, and it is just as well that they do not.

These men possess an enviable virtue—the virtue of good health. No weak-chested consumptive, no one deliberated by any disease can be included in the great army. Every member of it must be performed. If he does not, nothing is surer than the law regulating the survival of the fittest will force him to abandon his position to be filled by someone else. They must be men who can eat pork and beans and molasses, who can get along without butter and other delicacies of the table, and who can work in the snow, sleet and cold from daylight until dark for six days in the week, month after month. The business in which a logger is engaged calls for more endurance than that of a soldier, for in addition to exposure, the logger is called upon to do severe manual labour. During the civil war many of the most enduring men in the army, and as brave as ever faced a gun, came from the pineries of the three great lumber states.

It need not be supposed that because of the hard work in the woods, and a lack of so many of those privileges which are commonly supposed to make up civilized life, the loggers go dreadingly to their tasks. They gravitate to the forest as naturally as a small footed belle seeks the ball room. It is their life. They are used to work and do not expect to live without it. They feel at home under the trees, and in the camps, where of an evening they tell their stories through clouds of smoke. The fashions and ambitions that agitate the outside world, if none to them, cause them no unrest. In a certain sense they are happy, inasmuch as they eat heartly and sleep soundly. They are doing a more important work than they are aware of. They are filling a great niche in the world that is necessary to be filled, and which, if it were not filled, would be disastrous to trade and progress. The blow of an axe, and the click of the saw are the forerunners of many of the blessings that we enjoy, and which the ones who do so much to produce them are forbidden to enjoy, even if they have a desire to.

INTERESTING FACTS CONCERNING WOOD-PULP.

Until recent years only a few varieties of wood were used in making wood-pulp. The poplar was early liked for this purpose on account of its clear white fibre and the ease with which it could be converted into pulp. Spruce has been considerably used of late, and hemlock makes a good quality of pulp. A large number of factories have been established for the making of wood-pulp alone and there are good reasons why its manufacture should be often carried on separate from the other processes of paper making. Less capital is needed for making pulp only. The cost of a modern wood-pulp mill, with a capacity of five tons a day, is about $30,000, while a paper mill of the same capacity would cost not less than $100,000. Moreover, since pulp, as a commercial commodity, is easily transported, pulp making, unlike the paper making process, which can often be best carried on in or near some city, can be advantageously conducted in an out-of-the way place, where abundance of timber is at hand, and where water power, the cheapest of motive powers, and often found in connection with the clear, pure water necessary for pulp making, is abundant. Formerly the wood designed for pulp making, after having been reduced to pulp by powerful machinery, was boiled with strong chemicals in a generator, under great pressure, until the mass was digested into pulp; but recently many mills have introduced the grinding process. The wood, after being steamed soft, is ground by powerful machinery, which almost entirely dispenses with the caustic acid before so largely used, and thereby saves much expense. Of late experiments have been made in Canada with a view to utilizing the vast accumulations of sawdust at the lumber mills for the purpose of paper making, and some of the pulp made from sawdust has been sent to England to be tested. The idea of making paper from sawdust is not new. In 1852, Wilkinson, in England, patented a process of making paper from sawdust, and a man named Johnson also secured a similar patent in England in 1855. Although it is very evident that sawdust could be much more easily made into pulp than solid logs of wood, there are several serious obstacles that prevent the production of a proper quality of this pulp. One is this.—In making paper from wood it is necessary to remove all the bark and also the knotty portions before attempting to reduce the wood to pulp, but in the process of sawing lumber, portions of the bark and also of the knots are cut away and mixed with the sawdust. Then, too, all kinds of wood are being constantly cut in the saw mills, and the sawdust made of them all mingles and includes much pine pitch, which renders the whole mass of sawdust very objectionable for paper making purposes. To remove these obstacles and some others is the problem, and