Which is the best Saw Mill?—The Mulley.

MESSRS. EDITORS—The manufacture of lumber attracts a large share of public attention, and there has been quite a number of patent sawing machines lately introduced. We have also had several communications in your valuable journal about the different kinds of mills best adapted to the manufacture of lumber, also the amount cut by the various kinds. Some of the stories about "the thousands of feet sawed in 12 hours" were based, I suppose, on lumber, measured "in lump" through a magnifying glass; at least, I have taken the liberty of placing rather a liberal construction on such reports. "Doctors will differ," and, perhaps, it is right they should.

The question is often asked "Which is the best kind of saw mill to cut all kinds of timber?" I answer unhesitatingly the "Mulley saw mill." I rest my opinion on practical experience. I have used the sash in several mills, I have seen the circular saw cut in some of the best mills of the kind in the States, and they are the best mills to cut small timber, hard wood, or white pine of any size that one saw will cut. I have no faith in the double saw. I have used the mulley in several mills in this State and Indiana. I have seen nearly all the new kinds of cheap mills lately brought before the public, and none of them can compete with the mulley mill for cutting large, hard, and rough timber, and for quantity and quality of its lumber—the opinion of others to the contrary notwithstanding.

I have no faith in the statement of a circular saw cutting from 12 to 15 thousand feet in 12 hours—oak logs 8 feet long at that. A good average log—8 feet long—will make about 200 feet board measure. It would take about 75 logs, or between 600 and 700 cuts with the same number of runs back and sets, with 75 stoppages to put on and off logs in 12 hours. There are but 720 minutes in 12 hours, and this rate of sawing would be over 21 feet per minute from the time of starting at 6 A. M., to 6 P. M. I have had an interest in three mulley mills that cut about four million feet of lumber (8 feet oak logs, slabed and turned down) for the Glasgow and Huntsville plank road, in about 12 months sawing time by daylight; a great portion of the logs were small. It is true, we were over a year doing the work, but the mills were idle for want of water to make steam over half the time. The hands often tasked themselves to 5,000 feet board measure per day, and often finished it in 9 to 10 hours. I consider 3000 feet per day of hard lumber, with one set of hands, good work. It is as much as three hands—2 sawyers and engineer—can do, and keep up their mill in good order. Of white pine they could cut 10,000 feet just as easy. Our mills were made at Mount Vernon, Ohio, and are as good as any I have seen.

A new foundry at St. Louis is now building very good mulley mills; they are not quite as well finished as some mills which I have seen, but they are strong and durable—a very important item in a country where machine shops are few and far between.

Amongst some of the late improvements in saw mills is O. S. Woodcock's improved mode of hanging reciprocating saws. Patented Sept. 11th, 1855; illustrated in No. 8, Vol 11 SCIENTIFIC AMERICAN. I look upon it to be an invaluable improvement. Having seen it in use in a number of mills in Indiana, I was induced to purchase the right of using it in mills I was interested in here, and it has fully met my expectations from its simplicity and durability. I would recommend it to all using the sash or mulley saw mill, and no doubt it is just the thing for re-sawing boards.

Portable saw mills seem to be all the rage at this time in the Far West, where they build cities in the usual time it took to build a mill a few years ago; but all the new mills of the kind I have seen are so light and cheap that they are in a manner worthless, unless a man would purchase a foundry and machine shop with them. But why not build the good strong mulley mill on the portable plan. It can be built on the ground on a hillside, but a little elevated, or by digging a small pit in any situation. By using Woodcock's patent to a short pitman, say from 3 1-2 to 4 feet long, and driven by direct action, it will work without any perceptible friction on the cross head or slides. I shall give it a fair trial next spring and report. It would be a great saving of expense in some localities to dispense with the heavy two-story frame.

M. ENGLISH.

Glasgow, Mo.. Nov. 1856.

Steam Pile-Driving Machinery.

The following account of driving piles by steam power is from the London *Mechanic's Magazine*, and will be of interest to our civil engineers. Our country would be more benefitted than any other on the face of the globe by improved spile-driving machinery, because more works of this character are executed in the United States yearly than in all the kingdoms of Europe put together :—

"Mr. Robert Morrison, of Newcastle-upon-Tyne, has patented a machine or apparatus for driving piles by the direct action of steam, by which two or more rows of piles may be driven simultaneously without the necessity for any lateral or transverse movement being imparted to the pile-driving mechanism, and consequently the expense of driving temporary piles and erecting platforms for the machine to traverse laterally upon, from one row of piles to another, is obviated.

According to this invention, one, two, or more steam cylinders and driving rams are employed, according to the number of rows of piles to be driven at one time, the distance between such cylinders and rams corresponding to the width between the centers of the rows of piles. The cylinders and valve gearing are carried in suitable supports on one end of a traveling carriage on wheels, and a vertical tubular boiler and small steam engine for hoisting the piles and raising the cylinders when they have each driven a pile, are carried at the other end of the carriage. The boiler is fitted with a conical or tapered fire-box, the contracted end being uppermost. As fast as each pile in a row is driven, the machine is traversed forward between the rows to the next piles, and so on until the whole of the piles in each row are driven. The driving rams are made solid, and the pistons are forged or cast in one piece therewith. A stuffing-box is fitted on to each end of the cylinders, and the driving rams work through both the stuffing-boxes, which thus serve as guides without the necessity for any other means of steadying them during working. The lower end of the ram, or that part which works through the lower stuffing-box, is made cylindrical, whilst the upper portion, working through the top stuffing-box, is made square, to prevent the ram from turning round. Or in place of making it square it may be first turned cylindrical, and then have one side planed off, or it may be simply fitted with a feather on one side; any other form, however, would answer other than cylindrical.

The valves of the steam cylinders are so arranged that the steam may either be admitted on the underside only of the pistons for raising the rams, and then allowing such rams to fall by their own gravity to drive the piles, or the steam may be admitted on each side of the pistons, so that the force of the blow may be increased in proportion to the pressure of the steam. In the former case the upper stuffing-box will not, of course, require packing, but will merely serve as a guide to the ram. The small steam engine which it is proposed to employ for raising the cylinders after they have done their work, and hoisting fresh piles to deposit under the rams, is an inverted trunk engine, the lower end of the trunk being flattened to such an extent as will balance the weight of the piston trunks and connecting rod."

At a late meeting of the Institution of Mechanical Engineers, held at Birmingham, the inventor read a paper describing his machinery, but no report of it has yet been published. If one is published hereafter we may refer to this subject again.

Geometrical Models.

Professor Gillespie, of Union College, N. Y., has obtained from Europe a series of models, fifty in number, composing a whole set belonging to the department of descriptive geometry. They consist of minute combinations of silk threads, extended by weights, and designed to represent ruled surfaces. The process of intersecting, transforming, &c., is said to be truly wonderful, and the workmanship is of the most exquisitely delicate character There are but three such sets in the world—one at Madrid, one at Paris, and that at Union College.

The Friction of Machines.

We often receive communications requesting information relating to the friction of certain machines, such as the amount of friction in an air pump, or the amount in a steam engine per horse power. It is impossible for us to answer such questions in the affirmative; we cannot tell the amount of friction engendered in any specific machine. The fact is, that of two machines alike in every respect, but in the manner in which the work is executed, the one may cause double the amount of friction of the other. A steam engine may be so badly constructed as to expend its whole steam power in overcoming its own friction. The engine that embraces the best proportions, the smoothest working surfaces, and the finest joints will give out the greatest amount of power. A great amount of power is consumed in all machines in overcoming friction; and if it were not for the use of some lubricating material to obviate friction in the journals and joints of machines, it would not be possible to operate some machinery at all, because the friction engendered would absorb all the power. Friction in machines varies with the nature of the rubbing bodies. Bourne in his work on the steam engine, says :—

"The friction of iron sliding upon iron has generally been taken at about one-tenth of the pressure, when the surfaces are oiled and then wiped again, so that no film of oil is interposed. The friction of iron rubbing upon brass has generally been taken at about one-eleventh of the pressure, under the same circumstances; but in machines in actual operation, where a film of some lubricating material is interposed between the rubbing surfaces, it is not more than one-third of this amount, or 1-33d of the weight. While this, however, is the average result, the friction is a good deal less in some cases. Mr. Southern, in some experiments upon the friction of the axle of a grindstone—an account of which may be found in the 65th volume of the Philosophical Transactions—found the friction to amount to less than 1-40th of the weight; and Mr. Wood, in some experiments upon the friction of locomotive axles, found that by ample lubrication the friction might be made as little as 1-60th of the weight. In some experiments upon the friction of shafts by Mr. G. Rennie, he found that with a pressure of from 1 to 5 cwt. the friction did not exceed 1-39th of the pressure when tallow was the unguent employed; with soft soap it became 1-34th. The fact appears to be that the amount of the resistance denominated friction depends, in a great measure, upon the nature of the unguent employed, and in certain cases the viscidity of the unguent may occasion a greater retardation than the resistance caused by the attrition. In watchwork, therefore, and other fine mechanism, it is necessary both to keep the bearing surfaces small, and to employ a thin and limpid oil for the purpose of lubrication, for the resistance caused by the viscidity of the unguent increases with the amount of surface, and the amount of surface is relatively greater in the smaller class of works.

The nature of the unguent, proper for different bearings, appears to depend, in a great measure, upon the amount of the pressure to which the bearings are subjected—the hardest unguents being best where the pressure is greatest. The friction of lubricating substances is to prevent the rubbing surfaces from coming into contact, whereby abrasion would be produced, and unguents are effectual in this respect in the proportion of their viscidity; but if the viscidity of the unguent be greater than what suffices to keep the surfaces asunder, an additional resistance will be occasioned; and the nature of the unguent selected should always have reference, therefore, to the size of the rubbing surfaces, or to the pressure per square inch upon them. With oil the friction appears to be a minimum when the pressure on the surface of a bearing is about 90 lbs. per square inch. The friction from too small a surface increases twice as rapidly as the friction from too large a surface, added to which, the bearing, when the surface is too small, wears rapidly away."

Manufacture of Glass in England.

The greatest stimulus ever given to the glass manufacture of England was the abolition of the duty on it in 1845. That abolition has produced a somewhat paradoxical result.—While the quantity of glass made has increased in the proportion of three to one, the number of manufacturing firms has diminished in the proportion of one to two. In 1844 there were fourteen companies engaged in the manufacture. In 1846 and 1847, following the repeal of the duty, the number had increased to twenty-four. The glass trade, after the removal of the heavy burden imposed upon it, seemed to open a fair opening for money-seeking investment. The demand for glass was so great that the manufacturers were in despair. Glass-houses sprang up like mushrooms.—Joint stock companies were established to satisfy universal craving for window panes. And what was the result? Of the four-and-twenty companies existing in the year 1847, there were left, in 1854, but ten. At this time there are but seven in the whole United Kingdom. Two established in Ireland, have ceased to exist. In Scotland the Dumbarton Works, once famous, were closed in 1831, by the death of one of the partners, afterwards re-opened, and again closed. The seven now existing are all English.

[The above extract is from the London *Builder*. The manufacture of the finer kinds of glass was introduced into England not many years ago from Germany, and German operatives were employed, at very high wages. We understand that the English glass is now superior to the German. There is only one plate glass factory in the United States; it was commenced only two years ago near this city, and we understand that it has met with encouraging success.

A Rare Fossil.

The fossil department of the British Museum has received a valuable addition in the entire skeleton of the rare species of a gigantic wingless bird, recently described by Professor Owen under the name of *Dinornis phantopus*. This is stated to be the only specimen of Dinornis in which the skeleton has been constructed from the actual bones of one and the same individual bird.

Labor-Saving Soap.

Dissolve a quarter of a pound of lime in a gallon of cold water, then take off the clear; dissolve half a pound of sal soda in a quart of water, and mix it with the clear lime water. One pound of brown soap dissolved in a gallon of water is then to be added to the clear liquor formed with the sal-soda and lime water, and this forms the soap. This soft soap is excellent for boiling white linens; it removes all grease that is in them, because it contains an excess of caustic lye. About one quart of it is sufficient for boiling clothes in a ten-gallon wash kettle. A quantity of this may be made up and kept for constant use.

How Wind Produces Cold.

Winds produce cold in several ways. The act of blowing implies the descent upon and motion over the earth, of colder air, to occupy the room of that which it displaces. It also increases the evaporation of moisture from the earth, and thus conveys away considerable heat. This increased evaporation, and the mixture of warm and cold air, usually produce a condensation of vapors in the atmosphere; hence the formation of clouds, and the consequent detention of the heat brought by the rays of the sun. And whenever air in motion is colder than the earth, or any bodies with which it comes in contact, a portion of their heat is imparted to the air.

A new ship of war is being built at East Boston for the Viceroy of Egypt. She is 216 feet long, 37 wide, and 21 feet deep, and is to be ship rigged. She is intended as a yatch for the Viceroy of Egypt, who had her built in the United States upon the presumption that he would obtain a better model for speed than could be produced in either England or France. The framiug is mostly iron.