LIVERPOOL STOCK.

We take from the *Timber Trades Journal* the following comparative Table showing Stock of Timber and Deals in Liverpool on Dec. 31st 1884 and 1885, and also the Consumption for the month of Dec. 1884 and 1885:—

	Stock, Dec. 31st, 1884.	Stock, Dec. 31st, 1885.	Consumption for the month of Dec. 1884.	Consumption for the month of Dec. 1885.
Quebec Square Pine	226,000 ft.	226,000 ft.	66,000 ft.	70,000 ft.
" Waney Board	378,000 "	389,000 "	4,000 "	8,000 "
St. John Pine	21,000 "	20,000 "	10,000 "	22,000 "
Other Ports Pine	60,000 "	62,000 "	3,000 "	10,000 "
Red Pine	54,000 "	20,000 "	41,000 "	39,000 "
Pitch Pine, hown	521,000 "	280,000 "	24,000 "	84,000 "
" Sawn	297,000 "	600,000 "	15,000 "	23,000 "
Planks	44,000 "	78,000 "	8,000 "	21,000 "
Dantzic, &c., Fir	51,000 "	64,000 "	3,000 "	10,000 "
Sweden and Norway Fir	69,000 "	55,000 "	34,000 "	45,000 "
Oak, Canadian and American	239,000 "	289,000 "	35,000 "	76,000 "
" Planks	170,000 "	160,000 "	0,000 "	0,000 "
" Baltic	0,000 "	6,000 "	7,000 "	10,000 "
Elm	5,000 "	35,000 "	1,000 "	4,000 "
Ash	40,000 "	22,000 "	88,000 "	20,000 "
Birch	70,000 "	144,000 "	22,000 "	1,000 "
East India Teak	13,000 "	171,000 "	11,000 "	0,000 "
Greenheart	60,000 "	120,000 "	0,000 stds.	0,000 stds.
N. B. & N. S. Spruce Deals	25,207 stds	29,500 stds.	4,139 "	3,153 "
" Pine "	1,083 "	741 "	1,030 "	1,579 "
Quebec Pine Deals & boards	5,284 "	6,038 "	401 "	448 "
Do. Spruce	536 "	4,105 "	60 "	75 "
Baltic Red Deals, &c.	3,669 "	260 "	00 "	00 "
Baltic "Boards	31 "	1,333 "	652 "	495 "
" prepared Flooring	2,007 "			

AUGERS.

"Like many of our most useful inventions," said a prominent auger maker recently, "the principle of the auger now in use all over the world was discovered by accident. In 1680 Benjamin Paugh, an Englishman, while watching some school boys endeavoring to bore a hole in the ground with a piece of iron barrel hoop, noticed that after the hole had been sunken some distance into the earth and the flexible metal of their improvised boring tool had become heated, it twisted and carried the dirt up to the surface nicely, and he could not see why the same principle should not apply to wood. The invention of the auger was the result. The screw auger," he continued, "is an American invention, and was invented about 100 years ago by Thomas Garret, who lived in the vicinity of Oxford, in Chester County, this State, where most of the black augers are still made.

"Most of the bright tools are made down east, but one of the principal manufactories is in this city. The old-fashioned pod auger is still used in Germany and England.

"The single screw auger is also an American invention, and was first discovered by accident by a Philadelphian. It is the only auger that can be used to any satisfaction in very hard woods, where the double-screw augers become clogged."

Although every one is perfectly familiar with this common-place tool, but comparatively few know the process of its manufacture. In making augers the iron which form the main or spiral part is welded into the steel of which the tip is made before forging. The bar is then put under hammers and forged into shape. It is then put into what is called a wringing machine and twisted up in a rough state into the spiral form, after which it is passed through crimpers, giving a uniformity of twist. The augers are next put through straightners and revolved, making them perfectly straight, when they are ready for putting on the head, which is the most delicate operation in their manufacture and requires the work of a skilled artizan. They are then subjected to a grinding out process, which consists of putting them through two rubber wheels to rough polish the twist.

The fitter-up then takes hold of them and lightens or fits the head; then the filers file down and sharpen the heads, after which they pass through the hands of the polishers, where they are polished and hardened ready for market.—*Ex.*

THE NEW YEAR AND THE OLD.

From a business standpoint the year which has just ended was notable principally as a period of recovery. Since January, 1885, values have been slowly rising. In many instances the progress made appears but slight, and still nearly everywhere along the line the advance is sufficiently marked to be obvious to the most superficial observer, and in some industries the improvement is very noticeable. At the present moment it is safe to say that the outlook is decidedly encouraging. All the conditions essential for a prosperous year are now at hand. It is true that the silver coinage question is still unsettled, but with this single exception the commercial and financial conditions now ruling are thoroughly satisfactory.

The improvement in the iron trade, regarded in business circles as an especially encouraging sign, has been followed by equally favorable changes in most of the other leading industries. The stock market is particularly active, and as regards the lumber trade the reports from every important centre of this industry are very satisfactory. In Maine the season closes with stocks well sold out at the mills, and every indication of a greatly increased demand with the opening of spring. In the Middle States the situation is on the whole quite as encouraging. In the South we find the mill-men, as a rule, fairly satisfied with the business of 1885, and confident of still better fortune in the present year. To those who are acquainted with the resources of the Southern States this confidence seems perfectly justifiable. From the great lumber regions of the Northwest, where the trade has been most depressed, the advices are all highly encouraging. A year ago the manufacturers were complaining that the increased production had not been followed by a demand to correspond, and that stocks of lumber were accumulating to an alarming extent. But during 1885 the production of lumber was greatly curtailed, while the demand through the year was much larger than was anticipated. The result has been a large reduction in the stock now at hand as compared with that available a year ago. This combined with the certainty of a heavy demand in the spring and the favorable business conditions generally prevailing, has infused a hopeful feeling through all branches of the lumber industry of the Northwest.

There is in these circumstances nothing to warrant any extravagant anticipations as regards the business of 1886, but judging from present appearances, noting the abundance of money, the firmness in the stock market, the rising tendency in the prices of raw materials and manufactured goods and the increasing demand for labor, it seems certain that 1886 will be, as regards the volume of business transacted and prices obtained, a great improvement on the year which has just expired.—*Saw Mill Gazette.*

FORCE, POWER, AND WORK.

There exists in the minds of very many engineers with whom we come in contact but a very vague conception of the meaning attached to these three little words. Not so much does the difficulty appear to be in getting at a general sense of meaning for the words, as to separate the general idea conveyed into its factors, and to discern clearly just what portion of this whole is meant by force, by power, and by work. Let us therefore consider each in their order, and study their composition and relation.

We all have a pretty good idea of what force is, but the difficulty appears to be to disconnect the idea of force with that of motion. We can easily appreciate the force of gravity when we see a weight falling to the earth, but it is more difficult to comprehend the force as still existing, after the body has reached the ground, tending over to draw it nearer the earth's centre whenever its support shall be taken from under it. Force is exerted by the magnet as much in holding a nail against its pole as in moving it up there. When the nail was in motion, or the body was falling to the earth, there was power developed. Power is the product of force and space. If a magnet could lift a weight of one pound against the force of gravity through one foot, it would develop one foot pound of power. If the force of a cylinder full of steam can push a piston against 110 pounds through three feet, it will develop 330 foot pounds of power.

Now what is the difference between power and work. Work takes account of the time in which power is exerted. If the engine mentioned was 48 inches in stroke it would have to make one revolution to move the load through three feet as above. Now suppose the engine to run 100 revolutions per minute we should have 110 pounds move through 300 feet in a minute, which would equal one horse power of work. If the engine runs at 50 revolutions per minute we should have only 150 feet per minute =16,500 foot pounds per minute=one-half a horse power, and if it runs 200 revolutions per minute it would develop 66,000 foot pounds per minute=two horse power of work. Work is the consumption of power and the horse power, the measure of work is the measure of the rate of its consumption of power. It is evident, therefore, that a machine, the resistance which it requires a certain force to overcome, its resistance twice the number of times in a given time, and that it is not the pounds of force which a machine is capable of exerting which qualify its consumption of power unless we take into account the distance through which this force is exerted. For instance, a test of the power required by a certain shop was unsatisfactory to the man who owned the engine. He maintained that certain embossing presses consumed almost as much power in themselves as our instruments showed for the whole shop, and called our attention to the irresistible force with which the dies were pressed into their work. The press was a heavy one with a large fly wheel and a toggle joint with an enormous leverage. It was run at a moderate rate of speed and a man with a crank upon the fly wheel could easily have run the press at its usual rate and have exerted that enormous pressure upon the dies as many times a minute as when it was run by power. The force exerted was truly great, and would have measured a good many pounds, but the distance through which it was exerted, the depth of the impressions was a very small fraction of an inch smaller still of a foot, and when reduced to foot pounds of power amounted to but little, and this number of foot pounds was not repeated a sufficient number of times per minute to amount to much when reduced to horse power of work. It is surprising to see how much power is required by a small engine running at a high rate of speed. We have seen an emery wheel without work being ground upon it absorb a full one-third of the power required by a good-sized machine shop, while the variation in the load afforded by stopping and starting a large planer was comparatively slight.—*Boston Journal of Commerce.*

RAISING OAK TREES.

During the last few years large quantities of acorns have been taken from this country for the purpose of planting. White oak acorns are preferred, and they have been chiefly obtained in the State of Missouri. They are generally planted on sandy or broken land that is intended for pasturing sheep. In Great Britain sheep are accustomed to eat acorns, and it is considered profitable to raise them for sheep food. No variety of oak has received much attention at the hands of the planters of fruit trees. They state that that the trees make a very slow growth and for this reason they prefer to plant trees that grow rapidly and furnish fuel and timber in a shorter time. A foreign writer suggests that oak may be raied to excellent advantage in connection with other varieties of trees that grow rapidly. He admits that oaks grow slowly while they are young, but states that they increase in size rapidly when they are fifteen or twenty years old. If care is exercised they may be cut down so as not to injure the young oaks. These trees being removed *the young oaks will grow rapidly* and completely occupy the ground. Oaks are easy to propagate, as the acorns can be obtained at small cost and are almost certain to germinate. Acorns are much easier to manage than large nuts like those produced on the hickory or pecan tree. They can be planted *where it is* desired to have them grow, or in nursery rows, from which the small trees may be taken up when they are at a suitable size to be transplaned. The wood is excellent for fuel, timber and post.—*New Orleans Times.*

ROOFS OF PAPER.

A roof pronounced superior to that of slate, because of its lightness and other advantages, is now made of any fibrous pulp. From this *material tiles of any shape desired are formed* by pressure under machinery, or any other method which may suggest itself. Pressed into the designs wished for the pulp tiles are partially dried previous to being subjected to a water-proof solution. Thoroughly impregnated with the preparation to resist moisture they are baked to harden in them the water-proof mixture. After the baking the tiles are treated to a mixture imparting an enameled surface; to this is added a coating of sand, whereby the pulp is rendered proof against the action of heat or flame. By the use of different colored sands a variety of tints may be imparted to the tiles, which, after the application of the enameling mixture and sands are baked a second time, after which they are ready for use. *Besides the inherent lightness of pulp tiles*, which obviate the necessity of a heavy frame to support a weighty roof, the pulp tile, being tough and not brittle like slate, is far less liable to be broken from blows, stones thrown upon them or human footsteps. Again, slaty tiles cannot be laid compactly together on a roof, on account of their brittleness, which prevents their being drawn tightly together by nails. Through the fibrous pulp nails may be driven as close home as in shingles, thereby bending them closely to the bed and together without any possibility of lateral movement, or being blown away in a high wind, as slates loosely fastened on roofs so frequently are. Nails penetrate the pulp tiles more easily than shingles, and lie closer together, being more elastic than wood.—*Boston Journal of Commerce.*

TEETH AND SPEED.

The kind of teeth and the speed of the saw should be determined by the hardness and grain of the wood, its greater or lesser freedom from moisture, from gummy or resinous matter, whether frozen or not, also its size. The harder and the smaller the more upright should be the teeth, and the less their velocity and rate of sawing. Pine, willow, and alder require large, acute and well-pitched teeth; oak, mahogany, and rosewood, need perpendicular teeth, close together; yellow and pitch pine and larch being gummy and resinous, require grease to clear the blade; California redwood cuts like eastern pine. It is generally concluded that for pine, spruce, and hemlock the teeth should be cut tangent to a circle half the saw's diameter. Cedar cuts best with a peg tooth of fine gauge, pitch and space. Mahogany, ash and English elm are best cut with the gullet or mill tooth, of small space and nearly upright pitch. For maple, oak, and all timber known as hardwood, swaged teeth answer. For hardwood in warm weather, Norway pine, and chestnut, teeth partly bent and partly swaged are often used. For water-soaked spruce and pine spring-set teeth are generally used.—*Timber Trades Journal.*

A SUMMARY of last years lumber business in Minneapolis, as given by the *Pioneer-Press*, shows a decrease in the mill cut over the previous year of about 100,000,000 feet, a decrease in the boom scale of about 14,000,000 feet, a decrease in receipts of about 13,000,000 feet, and a decrease in shipments of about 8,000,000 feet. The figures for ten years past, however, show a large increase in business, and the reduction of last year was only an incident of the general depression prevailing everywhere.