

### ROOFS OF PAPER.

A roof 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 by any other method which may suggest itself. Pressed into the designs wished for, the pulp tiles are partially dried, previous to being subjected to waterproof solution. Thoroughly impregnated with the preparation to resist moisture, they are baked to harden them in the waterproof mixture. After the baking the tiles are treated to a mixture imparting 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 enamelling mixture and sand are baked a second time, after which they are ready for use.

Besides the inherent lightness of pulp tiles, which obviates 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 slate 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 binding them closely to the bed and together without any possibility of lateral movement, or be blown away in a high wind, as slate loosely fastened on roofs so frequently are. Nails penetrate the pulp tiles more easily than shingles, and they lie closer together, being more elastic than wood. Another great recommendation is the cheapness of the pulp tiles as compared with slate in every way—original cost and expense of transportation—the one being heavy and liable to breakage, the other light and of an elasticity rendering fracture exceedingly difficult. Pulp tiles may be used for other than roofing purposes; they can be adapted to the decoration of interior walls or for mantels. Capable of being ornamented in any style desired, the pulp tiles can be made to take the place of the heavier and far more expensive tiling now in general use. For employment in interiors of houses, the lightness is again a great advantage. When designed for decorative purposes the sand is omitted, then the enamel is of an exceedingly lustrous surface, comparing favorably in appearance with the ornamental tiles, notwithstanding their great weight, cost and liability to damage, if not entire destruction.—*Ex.*

### THE HORSE POWER OF ENGINES.

The manufacturers of the smaller prime-movers such as gas, hot-air and vapor engines, wind mills and water motors, do not hesitate, as a class, to over-rate the performance of their products in the matter of horse-power. There are exceptions, but they are in the small minority, and even manufacturers of standard prime-movers of this class fail in this respect, probably forced to the over-rating course by the competition of the many new concerns which are continually bringing their new—often undeveloped—designs into the market. This over-rating of these smaller prime-movers is a constant source of annoyance, gives rise to much difficulty, and is the main cause of any unpopularity which attaches to them as a class. The rating of horse power given is usually the theoretical maximum performance, no allowance for waste of heat and power, for loss by friction, and the like being considered. The purchaser, however, wants to know the daily average effective actual horse-power, as available from the driving shaft of the motor. This is what he must base his calculations on, and this horse-power is all that is of use to him, as far as the motor is concerned. The manufacturers of steam-engines, and of all the motors of large horse-power, had long realized the need of correct statements on this head, and live up to them. But with few exceptions, the manufacturers of the above mentioned motors of small power have not yet awakened to the necessity of accurate representation of the actual horse-power developed. This information will be of value to those engineers, who have not had ex-

perience with the small motors, and who are suddenly called upon to provide them. We should certainly advise them as a guiding rule, in procuring this class of motor, to order a rated horse-power, twice as great as that actually needed, for though in that case they may possibly in a few exceptional instances, secure a motor of slightly greater horse-power than they need or have figured on, as a general thing, the actual horse-power developed will be just what they want, and by no means too large. This, at least, has been our experience in a great number of instances, and accords with that of a number of engineers of our acquaintance.—*The Engineer.*

### USE WHAT YOU HAVE.

Every little while the columns of the daily press blazon forth the birth of a "new and valuable invention" which is to save from 20 to 100 per cent of all the fuel which is now consumed, and a little stir is excited by a sniff of bisulphide of carbon, would be money makers are heated to the boiling point over somebody or others new furnace, and speculation is estimated by the introduction of a little alcohol into steam boilers for purposes of economy. Now while so much time and thought and money is expended in endeavoring to effect a saving of fuel by some hitherto unknown means by the introduction of some new principle, or by the use of somebody's patent, would it not be well for those who are anxious to effect a saving in their fuel bill to consider how well they are doing with what is already at their hand. Do you know how nearly it is possible to approach to the actual value of coal in heat units transferred to water or steam in an ordinary boiler over a good plain, honest everyday setting; and do you know how nearly you are approaching that limit of possibility in everyday practice? Are you sure that your boilers are built and set with the proper proportion of grate and heating surface, and that the rate of combustion which you practice is that which will secure the most efficient results? It is a favorite statement of these inventors, or boomers, that only ten per cent of the value of coal is utilized, but this statement is made without any regard to the second law of thermodynamics, and oft the fact that a heat engine can only work through a limited range of temperature. Would it not be better to settle down in a rational way and undertake to get the most that can be got out of the material at our hands than to be continually running a wild goose chase after the unattainable, and being gulled by hairbrained schemes which look perfectly feasible only to those who know nothing of physical laws or of the principles of steam engineering?—*Boston Journal of Commerce.*

### FIRE.

An idea, as to the origin of fires in saw mills, planing mill's and other wood-working establishments, that seems to be general in insurance circles, is, to say the least of it, odd, if not wholly erroneous as far as its application to small mills in the country is concerned. That it is quite difficult to secure insurance on mill property lying idle in some remote district is well known, insurance companies assuming that because it is out of use it is in greater danger from fire than when in operation, therefore the risk is greater. The logic of their position has never yet clearly presented itself to us.

That a saw mill in the back woods, unused, unguarded, away from the thoroughfares of the country, no habitation of man within possibly a mile, save perhaps the isolated shanty of the sawyer, is more liable to be burned than one in daily use, is certainly hard to understand.

Its location in most cases is such that it seldom becomes the lodging place of tramps, and an occasional hunter may seek shelter beneath its lonely roof. Who else or save some enemy on mischief bent would ever find it?

"Ah, but," says the insurance man, "it is likely to be fired from spontaneous combustion in some old waste or refuse matter." Indeed, let us ask, who ever saw an accumulation of such matter around an abandoned saw mill property in quantities sufficient to fire it from such causes. Rather we would say the amount of waste grease, &c., is more conspicuous because of its scarcity than otherwise, as it is an undisputed fact that the average saw mill

man is poorly provided with such material.

The claims are not without foundation, in the case of an abandoned woolen mill, or similar enterprise, because of the fact that the very nature of the material worked (when in operation), is of such character that every crack, crevice, or hole in the building, and every journal box, and hanger, is saturated, filled full of it and liable to kindle at any moment. The building is tight, dust, instead of being blown away as in an open saw mill building, settles down over all this combustible matter, heat is created, and in an hour least expected the flame of destruction starts on its ruinous way.

Let us for a moment contemplate the dangers incident to the country mill in operation being fired by slabs, and if a planing mill is in use the shavings are also used. Sparks are treacherous things and liable to settle down under the roof on the framing timber, are easily blown under some loose dry board of the roof, or steal unnoticed into some lumber pile that the warm winds of summer has fanned, until it is as dry as was the pathway of the children of Israel when the waters were parted by the hand of God that they might cross to the other side. Or some careless fireman may leave the "smouldering embers on the hearth," all of which could be easily blown into a blaze. A thousand ways indeed to fire a country mill by accident, even when the employers are at hand, and when once thoroughly kindled all the limited powers at hand cannot arrest the fire until it has licked up with its forked tongues of flame, all that is within its reach. It may be that some insurance man may be able to controvert these facts and enlighten the public as to the basis of their claims, and we are quite certain their arguments will be received with favorable consideration.—*Lumber Trade Journal.*

### RUNNING ENGINES WITH WATER-WHEELS.

Whenever more power is needed, either constantly or at seasons of low water, or when variable work is being done, a steam engine may be attached to the line shaft which leads from the water-wheel by means of its main-band passing over a pulley on side line shaft (situated as near the wheel as practicable), said pulley to have such diameter as will permit both the engine and the water-wheel to make each its own regular speed. The effect of this is as follows: When the supply of water is ample for the work, the governor of the engine will shut off its supply of steam, or nearly so, and the steam retained in the boiler, little fuel being consumed. But when the supply of water fails, or the work is greater, for longer or shorter intervals of time the speed of the water-wheel is decreased, then this governor instantly opens the steam upon the engine, which in turn supplies just the amount of power needed to supplement and maintain the requisite speed of the line-shaft. So that, as long as the power from the water-wheel is sufficient to overcome its own friction and that of the line shafting, so long will its own water be utilized, even when it would be insufficient alone to accomplish any work at all beyond overcoming said friction.—*Saw Mill Gazette.*

### EFFECTS OF A BOOM.

There are those who conclude that a revival of business and speculation to the extent of an actual boom will tend to reduce the lumber demand, rather than stimulate it. They base their conclusion on the proposition that active trade and speculation will employ the capital that in dull times is forced into real estate investment and business enterprises. Hence, they say, as soon as the boom is under full headway, building will measurably cease. This may be so, to some extent, in the cities. But when trade, manufacturing and speculation are active and profitable, the farming class obtain good prices for their products, and naturally buy lumber and make improvements. This condition would be the reverse of that which has prevailed for the past two or three years. So we see that the loss of demand in the cities would be made up in the country. Besides times of active business and speculation, coupled with the prosperity of the farmers, induces railroad construction and car building. This, in case of

a boom to come, would be another additional cause of demand. It can be said still further, that in flush times with the railroads, the merchants and the manufacturers, the laborers in cities are well employed. When the middle classes and the laborers are thrifty, they build homes for themselves. The large cities in this country have all reached that stage of development when nothing can stop their suburban growth. The overflowing thousands must have houses, largely outside the city limits. For this reason metropolitan populations will continue to build and do it the more when times are good and earning constant. There may be less heavy building for investment during a boom, but a large aggregate, nevertheless, for the reasons stated.—*Northwestern Lumberman.*

### WHAT CONSTITUTES A MANUFACTURER.

In a recent decision in the case of the *Evening Journal Association* against the State Board of Assessors, the Supreme Court of New Jersey held that a company printing and publishing a newspaper is not a manufacturer. The decision is based upon the lexicographer's definition of "manufacture" as "the process of making anything by art or reducing materials into a form fit for use by the hand or by machinery," upon the ordinary and general use of the word "manufacture;" and upon the view that a manufacturer is one who by his skill and labor adds to the intrinsic value of the materials used, which gives them a merchantable value in the market as merchandise. "A newspaper," the judges say, "has intrinsically no value above that of the unprinted sheet, but has less value intrinsically as a mere article of merchandise. Its value to its subscribers arises in the information it contains, and its profit to the publisher is derived in a great measure from the advertising patronage it obtains by reason of the circulation of the paper induced by the enterprise and ability by which it is conducted." A person carrying on the business of book-binding and making blank books is a manufacturer; and a gas company is held to be a manufacturing company, because illuminating gas is an artificial and not a natural product, produced by the modification of natural substances by art and industry. An aqueduct or a mining company is not a manufacturer; nor is the painter or the sculptor, although he employs manual labor. In the case of the painter and the sculptor the opinion of the judges is evidently based upon the popular definition of the word manufacturer. To take such definition in the construction of legislative acts is, as they say, the cardinal rule.

### A MARKET FOR LUMBER.

The "staked plain" of northwestern Texas is a treeless area once considered a veritable Sahara for barrenness, says the *Northwestern Lumberman*. The vast stretch of territory has no timber but the mesquite, a scraggy bush, that seldom grows to much size. There is occasionally a spring that affords necessary water for stock, and water is easily obtained by sinking wells. The stock raisers who have a monopolized the staked plain as grazing ground have always contended that it was unfitted for agriculture. But latterly this has been disproved, and settlement along the lines of railroad has been rapid. Midland county, in the heart of the plains, is thirty miles square, and is described by Wisconsin man as a beautifully rolling prairie, with a soil from one to fifty feet deep, with a few living springs scattered here and there. The fact that there is land enough in the panhandle of Texas to make a large state, all susceptible of farming, but devoid of timber, opens out possibilities for the lumber merchant that are fairly bewildering. Texas, as a whole, is destined to afford a vast lumber market in process of time.

Work has been resumed on the Regina and Long Lake Railway. The grading is finished to Long Lake and track laying is being pushed forward at the rate of a mile a day. A working staff of seventy men and twenty teams is employed at present, and it is expected that the road to Long Lake will be completed within ten days.