The Practical Inspection of Woodworkers

W. T. Burwell, Special Agent, Phoenix of Hartford.

Mill Inspection as Pertaining to Pacific Northwest—Physical Inspection—Moral Hazard and Adequacy of Rate—Paper Read Before the Insurance Club of Vancouver—First Installment.

In discussing this time-tried and fire-tested subject, I shall let the paper be its own apology. No exhaustive insurance experience has guilded its pages with the illumination of professional learning. No ponderous and dusty volumes have been brought forth from the catacombs to lend their lustre, nor have the ruthless shears and paste-pot shorn the manuscript of my contemporaries of their choicest paragraphs, making the article an epigramatical review of previous writers on this interesting subject.

This paper is only the result of many years practical experience in the design and erection of saw mills and wood working machinery in the Pacific Northwest, seasoned with a smattering of the ordinary principles of insurance.

On account of the broad scope of the question involved, I have limited this paper to a discussion of saw mills, taking the average mill of good class as an example. With the exception of the danger caused by the presence of cedar dust or dry shavings, the hazards of shingle or planing mills will roughly conform to such a woodworker.

So also in the case of dry log mills, the hazards in this district are similar in great degree with the hazard of the wet log plant, for the logs, while technically called dry, are in reality hauled to the log dock directly from the woods or from tide water and are nearly as moist as those taken from a log pond. They are not so clean and free from gravel as the wet log, but this hazard is inconsiderable. In the Middle West, where logs are stored for the mill, and undergo a drying throughout the winter months, an entirely different condition may be expected.

In discussing the practical inspection of woodworkers, I find that the subject falls naturally into three divisions: the physical inspection, the moral hazard, and the adequacy of the rate.

Taking each of these three factors in turn and determining the relative condition and importance of each factor, the inspector may be in a position to pass intelligently on the desirability of any risk of the class.

Physical Inspection: I know of no better way to review the general features of a saw mill than to follow the manufactured product in its course through the plant. The complete saw mill plant is usually made up of seven divisions: head end, central portion, tail end, power house, lumber yard, dry kiln and finishing department. I will take each department in turn, using the common saw mill nomenclature for the different pieces of machinery used.

Beginning, then, at the boom, we find the log drawn into the head end of the mill by the log jack, or by the more modern wire rope log haul. Either of these pieces of machinery, while very powerful, is slow moving and surrounded by the moisture common to this portion of the mill, needs no special attention. From the log deck the log is transferred to the saw carriage by a log canter or by a steam kicker, or nigger.

These log loading devices, as in the case of the log jack or haul, are powerful but slow moving with a minimum of friction hazard. A glance should be given the steam cylinders of the kicker or nigger, located beneath mill floor, to see that oily waste is absent and that the steam pipes run clear of woodwork.

The saw carriage, with the log attached to its head blocks, is drawn across the head saws by means of the steam feed, which may be either the wire rope or "shot gun" type. This is located under the mill floor beyond the head saws, and is a powerful, fast moving piece of machinery. Steam pipes should be clear of woodwork; there should be no accumulation of oily waste; and if a rope feed, sheaves of the feed should be well lubricated.

Next in order is the head saw. This in most Northwest mills is composed of the single or double circular saw or of the heavy duty Pacific Coast band saw. When we consider that nearly one-fourth of the horsepower of the mill is consumed at this point, we recognize the importance of having the bearings of the saw arbors run cool with sufficient lubrication. There is always a surplus of dust at this point, happily in a damp condition, but oily sawdust should be kept free from the bearings as far as possible. In electrically operated mills, the starting rheostat should be of the enclosed controller type on account of the prevalent moisture and sawdust. If of the open or ventilating type, millwrights will frequently enclose it for protection, the result often being a charred box, and a subsequent claim under the policy. Where band mills are used hazards of this character are safely guarded, for the entire band mill is set up in the factory and the bearings made of a good quality of truly aligned babbitt metal.

From the head saws the slabs fall to the automatic live rolls or iron rolls turned by transmission machinery, which convey them to the chain transfers, these in turn picking up the slabs and taking them across to the edger. The live rolls and transfers are put in operation by means of paper and iron friction wheels located beneath the mill floor. Rockwood frictions are almost universally used in this locality. They are fire resistant, but on account of their location, may be inspected for faulty lubrication or oily condition.

We have now arrived at the central portion of the mill. This is given over mainly to the edger and overhead filing room. The edger consumes about one-fifth of the available mill power and its location and characteristics make it one of the most important fire hazards of all the moving machinery. The inspector should see that the edger roll steam pipes are clear of the woodwork and that the steam cylinders and bearings on both the shafts beneath the mill floor are well lubricated and free from oily sawdust.

A water barrel with pails or approved fire extinguisher should be placed adjacent to the machinery for incipient hot boxes, for at this point a number will develop during the working season.

The majority of edger shafts are driven from the main mill shaft by means of rope drives or through steel wood tooth friction gears. The condition of the former may be seen at a glance, but as the latter are usually enclosed on account of the oily condition under which they are run, it is difficult to make a satisfactory inspection. They are usually of excellent construction and the hazard may be passed as inconsiderable.

Over the edger and head saw may be found the filing room where the different saws are carried to be reground, either by hand or automatic machinery. This may be inspected for small unventilated closets, the presence of gasoline or the presence of the unguarded steam pipe in connection with the small independent engine sometimes used, accumulation of waste, proper arrangement of saw brazing furnace, etc.

Having finished with the central portion of the mill, it will be found convenient to inspect the power plant. The boilers here are usually arranged "en banc" and should be at least four feet from walls or wooden partitions. They are fed by small conveyors bringing sawdust fuel from the head saws and the edger saws in ordinary boiler settings. This sawdust is dumped directly into the boiler grates by an overhead conveyor. Where the boilers are equipped with a Dutch oven front, the refuse will be poured through the Dutch oven ring or hopper by chutes, preferably of metal, leading from the conveyors. Suitable gates in the conveyor channels allow part of this fuel to be diverted into fuel piles or fuel storage vaults at the side of the boiler room, this accumulated fuel being used to fire the boilers for kiln and other purposes when the mill is not running and generating fuel.

The vaults should be of eight-inch brick, or of standard crib construction, sides and roof, with walls six inches thick, the opening from which the fuel is drawn being located in the base of the vault and being protected by a two-inch sliding drop door. This door is usually sheathed with metal and supported by a wire running on an overhead pulley and held up by a fusible link, the connection being inside of the fuel vault.

If open piles of fuel are stored, they should be separated from the boiler openings by a clear space of four feet, an iron plate being used as a retaining partition.

Smoke stacks for the boilers should be kept twelve inches from woodwork, and if less than thirty feet in height, one-fourth inch mesh spark arresters are well nigh essential. The roof of both power house and mill should be of non-combustible material.

The engine room should be inspected for closed or unventilated closets and oily waste or a general oily condition. If oil is stored in the engine room it should be in small quantities only, the main supply of oil for both power house and mill being kept in a detached shed or oil house located at least forty feet from the mill buildings.

Too much stress can not be laid on the fact that the power house should be detached from the mill itself. A power house detached by only twelve inches is far superior to one located under the mill roof, especially in those cases where a suitable hydrant and hose is located adjacent to the separating opening. The walls of the power house should be built of standard brick or 2" and 6" crib construction extending above the mill roof. The wall opposite the mill should extend four feet beyond the side walls and doors and windows should be avoided on this side of the structure. The writer can cite many instances where this building method has saved valuable plants, notably in the case of the Hoquiam Sash and Door Company, where a serious fire in the boiler house did no damage to the main building fifteen feet away.

We can now proceed with the inspection of the rear, or tail end of the mill. From the edger the lumber drops to the edger live rolls which are driven by the usual frictions under the mill floor.

In the smaller mills the lumber passes to a swing cut-off saw which cuts it by hand into suitable lengths. The waste or bark slabs are cut in the same manner and thrown into the main conveyor which carries them either to the boiler house or the refuse fire. In the larger type of mills the refuse slabs are shoved from the rolls to a chain transfer table where they pass under a constantly running slab slasher and into the main refuse conveyor, which carries them to the refuse burner. The slab slasher has many sudden loads applied and the bearings should be well lubricated and of sturdy make.