

spent in keeping a closer watch on the logging engines, rather than calling on the larger round houses so frequently.

The reason of the poor conditions of the logging engines is the frequent changing of crews, and the master mechanic or superintendent of the company neglecting to make personal inspections as to the conditions of same.

Records of head end and ash pan inspections at the larger round houses are kept to date with a few exceptions. Quite a large number of the smaller round houses which are terminals, where they house from two to five engines, keep no record at all.

Of the various kinds of head end spark arresters, now in use, the "Slater Box Front" of the C. & N. W. Ry. is the best. The Master Mechanic front ends used by the C. M. & St. P. Ry., Soo Line, G. B. & W. Ry., and others, are efficient and give very good service if kept in repair.

The "Teepee" stack hood used by the C. M. & St. P. Ry., is a very good one. At that I doubt if it is any better than the one used by the C. & N. W. Ry., which is a much easier one to be made and cheaper in construction. The Soo Line hood is a good one, but a bungly affair, and much more expensive to make than either of the others.

Engine crews with whom I have talked find no fault with the steaming of engines with hoods attached. The objection they have is that the cab is filled with live cinders, making it very disagreeable.

The Soo Line has installed on the sides of all their engines carrying stack hoods, observation windows, which will do away with a great deal of the unpleasant features regarding cinders.

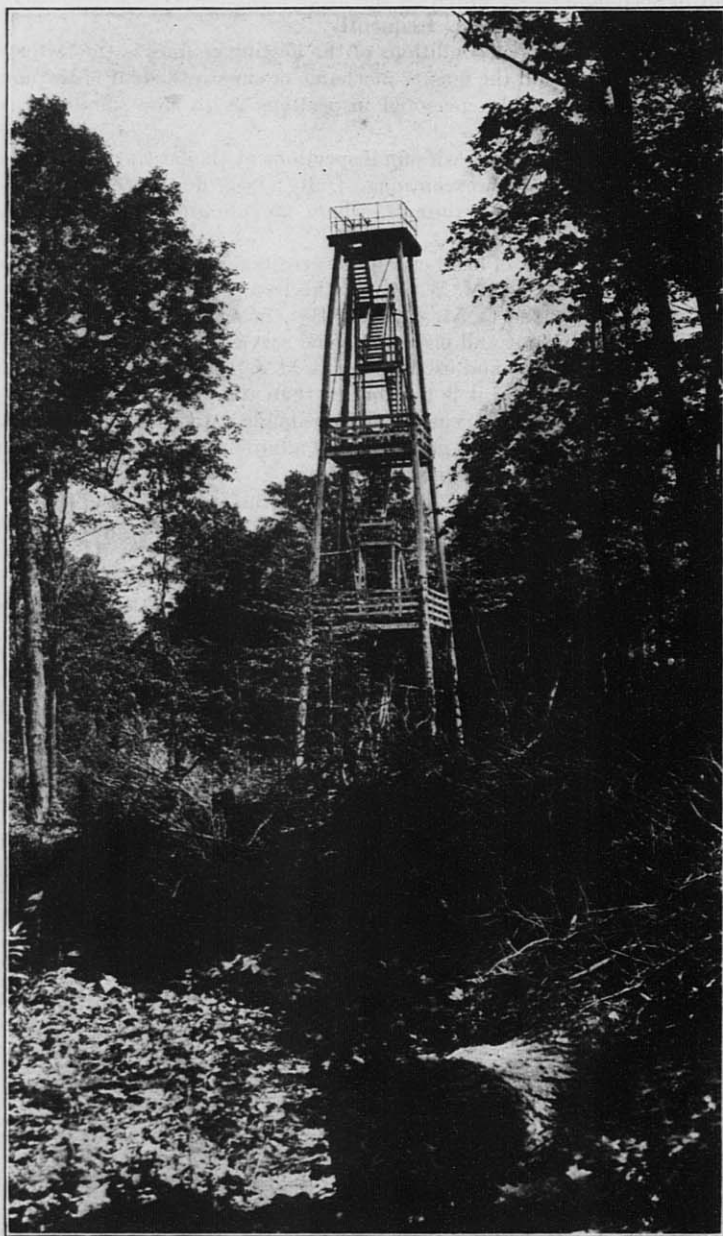
Of all the different styles of ash pans, the hopper slide and C. B. & Q. of the large type of engines is the best. The hopper pan with drop bottom is a very poor one. The only engines equipped with same are the Lake Superior Terminal & Transfer Company of Superior, and they do not leave the yards.

The best pan for the small standard engines is the swipe pan, but I note that the C. M. & St. P. Ry., are replacing same with a shallow hopper pan which is not giving very good satisfaction, by reason of the many openings caused by the slide running through the hopper. The slat bottom pan, of which there are but very few still in use, are the poorest and most dangerous.

Twenty-seven rights-of-way were inspected. Of these, two were found to be "Good." The right-of-way of most of the main lines of the C. M. & St. P. Ry., the N. W. Lines and the Soo Line, are in very fair condition. None of them, however, are strictly within the law, and could be improved upon.

#### FOREST FIRES IN 1915.

Favorable weather conditions during the past four years have kept the damage of fires to a minimum. At the end of the fire season of 1915, circular letters were sent out to all town fire wardens outside the protected area. The data compiled from the reports of 318 fire wardens is as follows:



LOOKOUT TOWER. 75 FEET HIGH. PENINSULA STATE PARK

Distributed by Causes.	
Lightning.....	4
Railroads.....	35
Lumbering.....	2
Brush burning.....	56
Campers.....	14
Incendiary.....	5
Unknown.....	52
Miscellaneous.....	6
Total number of fires.....	174

The total area burned over, including both timbered and open land, was 46,511 acres, while the damage to timber and improvements amounted to \$28,132. This data is significant, since the season was a very wet one. In spite of this fact, however, many fires were started and considerable valuable property destroyed. In order that we may be prepared for the real dry periods, which are bound to come in the near future, probably within five years, it is hoped that a well organized scheme of forest fire protection may be developed, and that individuals, corporations and other landowners organize forest fire associations and make it possible to co-operate to the fullest extent with the State throughout the wooded regions.

#### COÖPERATION WITH FEDERAL GOVERNMENT IN FIRE PROTECTION

In 1911 Congress approved an act (Weeks Law) authorizing the Secretary of Agriculture to coöperate with states in the protection from fire of forested areas at the headwaters of navigable streams, and an appropriation was made available for such protection. Under the coöperative agreement, States were obligated to spend an amount equal to the allotment provided by the government. Wisconsin was one of the first states to coöperate and has received an annual allotment of \$4,500.00. Under the agreement entered into in 1916, eight federal patrolmen were appointed by the Conservation Commission for a period of six months and have been given definite districts to patrol and are under the direct supervision of the Head Ranger. During periods of no fire danger these patrolmen are employed in permanent improvement work, such as building trails, fire lanes, telephone lines, roads, etc. A close coöperation exists between the Federal Patrolmen and the State force of eight forest rangers.

#### PERMANENT IMPROVEMENT WORK

In the development of the forestry work some 37 buildings have been erected to shelter the ranger force at an approximate cost of \$28,600. Two forest nurseries have been established which have an output of 1,000,000 trees annually. Other improvement work includes the building of about 250 miles of roads, 140 miles of fire lanes, and 80 miles of telephone lines.