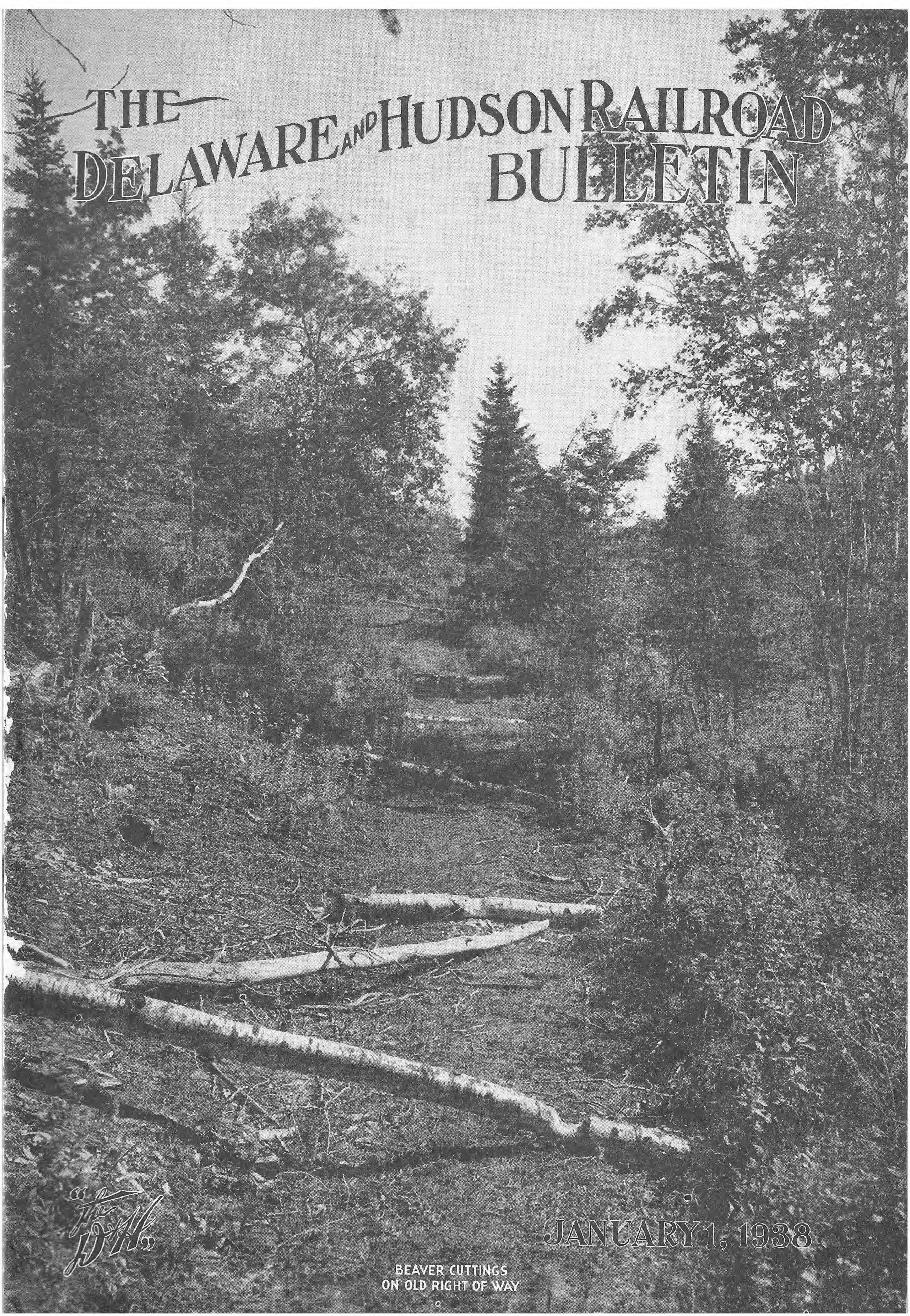
THE DELAWARE AND HUDSON RAILROAD BULLETIN



"The D&H"

JANUARY 1, 1938

BEAVER CUTTINGS
ON OLD RIGHT OF WAY

A New Start

I WILL start anew this morning
With a higher, fairer creed;
I will cease to stand complaining
Of my ruthless neighbor's greed;
I will cease to sit repining
While my duty's call is clear;
I will waste no moment whining,
And my heart shall know no fear.
I will look sometimes about me
For the things that merit praise;
I will search for hidden beauties
That elude the grumbler's gaze.
I will try to find contentment
In the paths that I must tread;
I will cease to have resentment
When another moves ahead.
I will not be swayed by envy
When my rival's strength is shown;
I will not deny his merit,
But I'll strive to prove my own.
I will try to see the beauty
Spread before me, rain or shine;
I will cease to preach your duty,
And be more concerned with mine.

—SELECTED.

"the D&H" The DELAWARE AND HUDSON RAILROAD CORPORATION "the D&H"

BULLETIN

Lake Ladore Excursions

Attracted 1,500,000 Passengers in Summer Seasons from 1898 to 1917

MORE than 1,500,000 excursionists were carried on Delaware and Hudson trains from points on the Pennsylvania Division to Lake Ladore, on the Honesdale Branch, during the summer seasons of the years between 1898 and 1917, according to retired CONDUCTOR GEORGE CHAPMAN who ran trains in this service throughout the entire 20-year period.

When the excursion season was at its height each year as many as 2,500 people rode on each of several two-engine, 25-car trains originating at various cities in Lackawanna and Wyoming Valleys almost daily. Despite the fact that at points the single-track Honesdale Branch was built on a grade which rose 121 feet to the mile, two 700-class locomotives, one at the head end and another behind the seventh car, were all that were needed to handle these long trains. The coaches were equipped with retainer valves when built at the Carbondale Car Shops, enabling engineers to control the train on the steep descent of the return trip as easily as a five-car train could be handled ordinarily. To the best of MR. CHAPMAN'S knowledge none of the one and a half million excursionists carried was injured and none of the cars in this service was ever damaged or derailed.

GEORGE CHAPMAN

From 1874 until the Gravity Railroad was abandoned in 1898 Farview, at the top of the range of mountains lying between Carbondale and Honesdale, had been the favorite rendezvous for excursionists. Narrow-gauge coaches were pulled up the nine planes between Carbondale and Farview by stationary engines, the return trip being made by gravity power.

Excursions came to an abrupt end during the World War and this once tremendously popular pastime was never revived although, oddly enough, the last excursion train, operated from South Scranton to Lake Ladore in 1917, consisted of 25 cars, all loaded to capacity.

While interruptions in his employment during the early years of his career reduced his last period of continuous service to 58 years, MR. CHAPMAN never worked for or received pay from any other employer from March 1, 1873, until he retired on pension over 64 years later on June 1, 1937. Equally noteworthy is the fact that he was a conductor for over 51 years, a record few railroaders can surpass.

Despite his unusually long service record, MR. CHAPMAN was only 71 years old when he retired.

Born at Sterling, Scotland, May 1, 1866, GEORGE was six when his family came to America, settling at Carbondale. The next year he was hired by Superintendent John Bowers as a slate picker in the Racket Brook Breaker, two miles east of Carbondale, where coal mined at several workings was prepared for market. About 50 boys were employed to remove slate from the coal as it slid down chutes in the breaker. School facilities were then so poor that most children worked, attending classes only when breakers were not in operation.

Later in 1873 GEORGE was hired as office boy by Master Car Builder Thomas Orchard. All the coal cars and coaches used on the Gravity Railroad were built in the Carbondale Car Shop, then housed in the building which now serves as a storehouse in back of the division offices. With the exception of metal parts the cars were entirely built by The Delaware and Hudson force, the wheels being purchased from Van Bergen's Foundry which stood just south of the present roundhouse. GEORGE served as office boy, messenger, and in other capacities at intervals until October 1, 1879, when he became Wreck Foreman Fred Topping's office boy.

When a wreck occurred on the Gravity the 5-ton capacity wooden cars were simply pulled clear of the tracks by the huge horses stationed at intervals to start trains which stalled on the levels, or a long pole was used as a lever to pry the wreckage off the right of way. Cars of three sizes were used on the two-gauge steam railroad between Carbondale and Wilkes-Barre: 4½-ton coal cars, 9½-ton gondolas, and 15-ton gondolas. When these larger units were damaged in derailments, the wrecking crew "mopped up" with the aid of a four-man, hand-operated derrick mounted on a flat car. This "big hook" of the early eighties would pick up about three tons; by way of comparison, the steam wrecking crane now stationed at Carbondale will lift 160 tons.

In 1880, GEORGE oiled cars on the Gravity, oil-saturated waste being used to lubricate them then as now. The loads were so light, however, that "hot boxes" were seldom encountered. MR. CHAPMAN therefore saw the "hot box" problem grow from practically none in the eighties, to the point where, while working in the main line train service, he took a solid train of 57-hot-box-crippled cars south from Ararat at once. Today, frequent repacking and inspections, combined with scientific preparation, distribution, and use of lubrication has reduced their numbers to one in 370,000 miles in freight service and one in more than 1,000,000 miles in passenger service.

Car inspectors were stationed at No. 2 plane on the Gravity where all empty cars returning from Honesdale were carefully examined for defects, "cripples" being switched out and "dropped" down the planes to the Car Shop.

Late in 1880 MR. CHAPMAN was hired as brakeman on the steam railroad by Train Master S. A. McMullen, running north from Carbondale to Nineveh and south to Wilkes-Barre. The tremendous development which has taken place in railroading in the past 60 years is graphically illustrated by his recollection that 25 9½-ton capacity coal cars were then a two-engine freight train's tonnage. To move one of these 255-ton trains north from Carbondale to Ararat required two engines. Today a freight train with one lead engine and two helpers will take 6,000 tons, or 24 times as much, over the same grade.

During a business recession in 1884, MR. CHAPMAN worked as a carpenter under Master Bridge Builder George Burrell, repairing the wooden bridge at Providence which spanned the Lackawanna River. MR. CHAPMAN also recalls that when he first ran north to Nineveh the span on the present site of the gauntlet bridge at Center Village was an all-wood, covered bridge. To avoid a fire such as had destroyed the Rensselaer and Saratoga Railroad bridge over the Hudson between Green Island and Troy, May 10, 1862, a Mr. Hatch was employed as watchman to walk through the 300-foot span after each train passed to be sure that no fire had been started by flying sparks.

Beginning in 1885, MR. CHAPMAN was occasionally called as extra conductor and the following year he was promoted by Train Master McMullen who assigned him to a Carbondale-Nineveh freight run with ENGINEER THOMAS MCCAWLEY.

For 20 months beginning in October 1917, MR. CHAPMAN served temporarily as assistant train master of the Pennsylvania Division, returning to the train service as local freight conductor. The next year he again entered passenger service on the

(Continued on page 13)

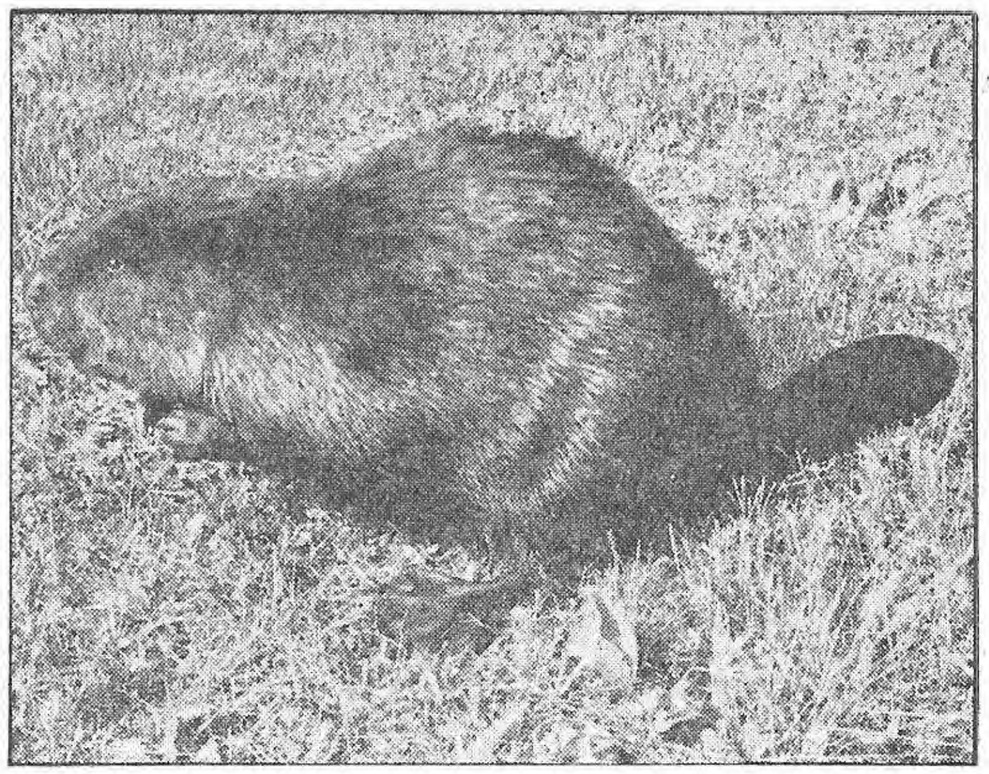
The Cover Photograph

BEAVER, trapped by New York State Conservation Department employes on private property where they had been doing damage and released on the Debar Mountain Game Refuge, 20 miles north of Saranac Lake, felled the trees across the right of way of the Chateaugay Railroad's Tekene Branch, as shown on this month's cover photograph. These amazing animals, nicknamed "Nature's Engineers" by some naturalists, together with their activities in the vicinity of this old railroad, are described in the article beginning on page 5.

Beaver Dams Flood Abandoned Tekene Branch

DEEP in the Adirondacks—20 miles north of Saranac Lake as the crow flies—is the abandoned embankment of a portion of the Tekene Branch of the Chateaugay Railroad which, when forsaken by the human engineers who built and maintained it, was taken over by nature's engineers, the beaver. These amazing creatures, picked by some naturalists as America's most interesting animals, have used portions of the now weed- and brush-covered embankment in constructing their dams and have flooded an area of several square miles, completely submerging parts of the abandoned right of way.

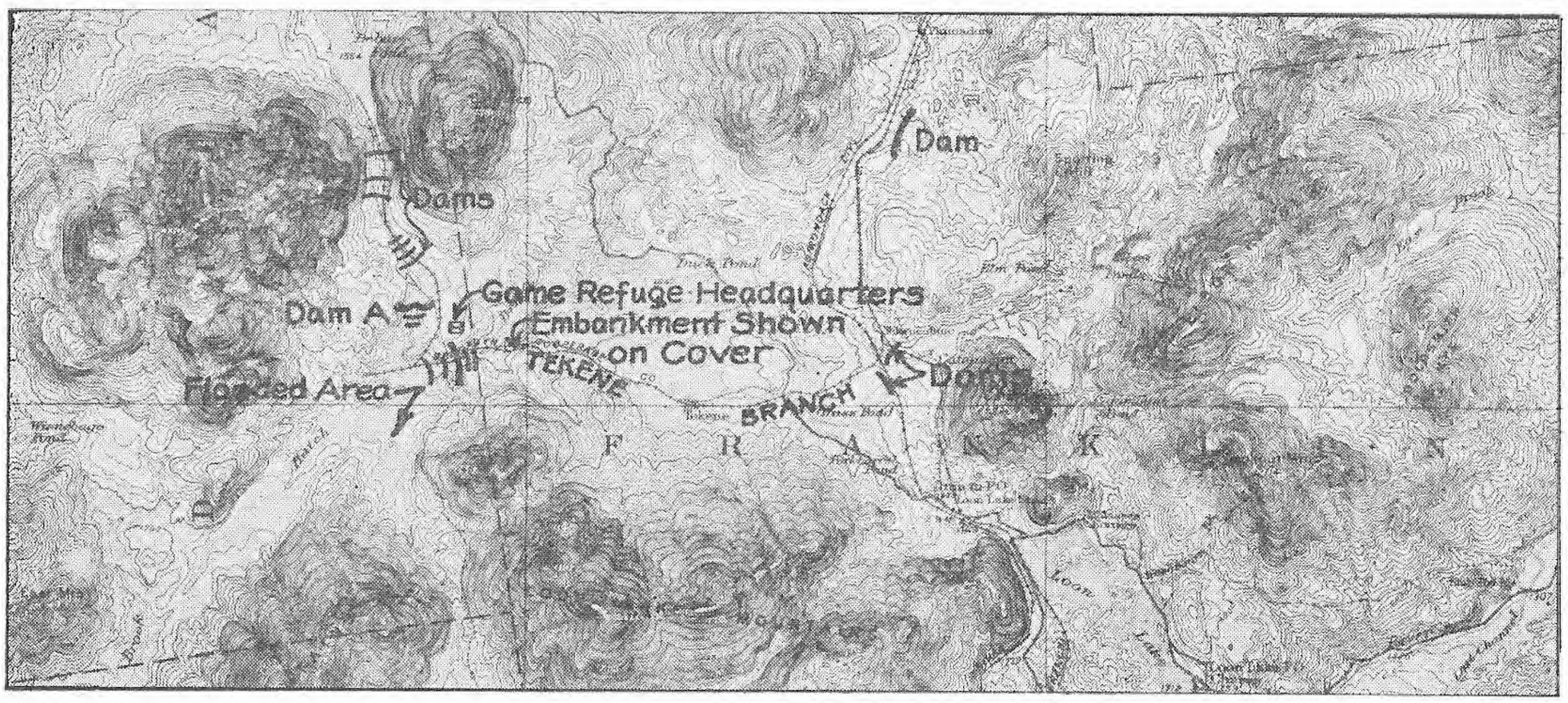
This railroad left the Chateaugay Branch at Tekene Junction, 1.7 miles north of Loon Lake, and, skirting the base of the Loon Lake Mountains, wound its way 4.5 miles westward, over unusually heavy grades, to a point known as the "End of the Iron," at the base of Debar Mountain. En route it crossed Hatch Brook, following this stream on an embankment to the foot of the valley lying between Debar and Baldface Mountains. A 2.3-mile spur track ran north through this valley, terminating at Debar Pond. By building several dams across Hatch Brook between the embankment and the foothills opposite, the beaver flooded a large area of what was formerly marsh



Fifty-Pound Male Beaver

land between Debar and Sable Mountains. A feeder stream paralleling the Debar Pond spur has also been dammed in half a dozen places in the first mile of its length, while on the other side of the natural divide toward Debar Pond, are several more dams.

The Tekene Branch was built by the Chateaugay Railroad Company in about 1888 over a right of way obtained from the Chateaugay Ore and Iron Company, to transport lumber out of the area. The entire branch was abandoned and the rails taken up in February, 1918. Subsequently the last mile of the right of way of the main branch and all of the spur were included in the 9,000-acre tract set aside as the Debar Mountain State Game Refuge. In addition to serving as an area where deer, bear, and other game animals can escape the hunters' guns, it provides a place where beaver



Map Showing Beaver Dams on Tekene and Chateaugay Branches

removed from private property at the request of the owners, may be released.

The story of the beaver itself, together with the influence it had on the early settlement of New York State in general, and Albany in particular, is one of the most interesting episodes in the history of American wild life. The principal reason for the planting of a Dutch colony at what is now Albany, in 1620, was to establish a trading post at which Old World goods could be exchanged for the Indians' furs. The best furs, and those most eagerly sought by the traders, were those of the beaver, the importance of which is evidenced by the fact that the official seal of the colony had a beaver as its chief emblem.

Early historians record that in 1624, 4,000 beaver and 700 otter skins, were shipped from Albany. Albany's beaver trade grew to the point where in the year 1658 alone 57,640 furs, worth nearly $200,000, were forwarded. With the exception of the Hudson Bay Settlements, no American point rivaled Albany in the extent of the beaver trade, Indian and White trappers bringing the pelts in from the furthermost parts of the state as well as Canada, the latter despite the law strictly prohibiting the sale of Canadian furs to any but French West India Company representatives. The fur trade reached its height in about 1660; thereafter, the beaver having been exterminated locally or driven farther afield, the settlers turned to farming. By 1788 the once lucrative fur trade of Albany was virtually gone.

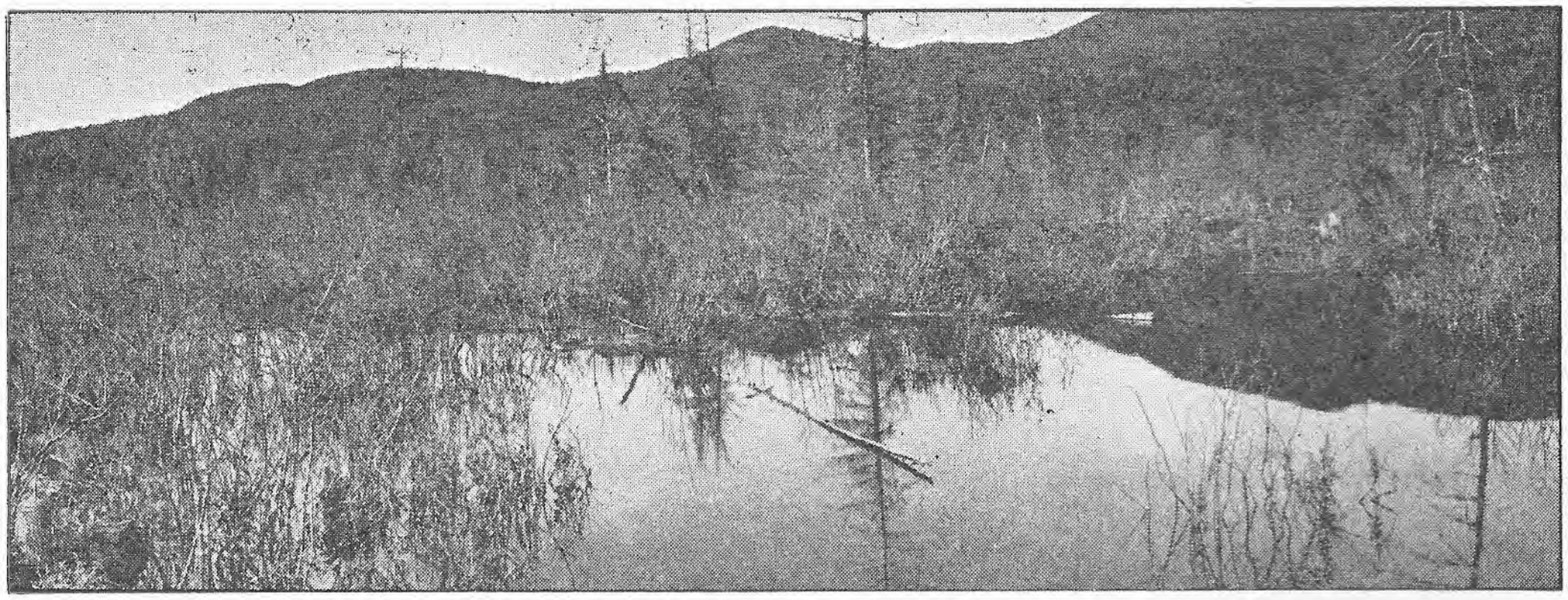
Conservationists believe that when the White Man arrived there were 1,000,000 beaver in the Adirondacks alone; in 1800 there were 5,000; and not more than five or ten families in 1895. Beaver approached complete extermination in 1900 when, according to estimates, there were only 15 in the Adirondacks. Protective laws and restocking increased their numbers to 40 in 1905, 250 in 1908, and 20,000 in 1915. *Today there are more beaver in the two lodges in the single dam shown in an accompanying illustration than there were in the entire Adirondack Forest Preserve at the turn of the century!*

The beaver is the largest living animal of the order of rodents, or gnawers, with the single exception of the South American capybara, and belongs to the same family as squirrels, rats, mice, etc. However, whereas most of the other members of the order are land creatures, the beaver is essentially a water animal, combining the general shape of an overgrown muskrat, with the webbed feet of waterfowl, and having a highly specialized paddle-shaped tail. Adults vary in total length from 40 to 45 inches, of which the tail occupies from 12 to 15 inches, and weigh from 40 to 60 pounds, although there are records of New York State beaver which weighed over 100 pounds.

The color above is a dark brown, with considerably darker, dusky underfur while the underparts are somewhat lighter, inclining toward a pale chocolate brown.

The tail is of an oval shape and is covered with a very dark, hard, scaly skin. It serves as a brace when the owner is standing up cutting down a tree, it is used as a rudder when swimming, and at times as a scull to give increased speed. In diving when alarmed, a beaver often gives an alarm by slapping the water with its tail, making a loud noise.

Although the eyes are small and the range of vision is probaly limited, they are quick to detect a moving object. Hearing is keen, though the ears are comparatively short, an inch and a half high, lined with fur, closing when under water. The



Flooded Area at Junction of Tekene Branch and Debar Pond Spur

small nostrils also close under water and the sense of smell is very acute. The mouth has hairy lips closing in back of the incisor teeth to exclude water when the animal is working below the surface.

The hind feet, measuring as much as seven inches long and five inches wide, are webbed, somewhat resembling those of a goose, with long, strong toes, each with a good-sized nail. There are five toes, the third and fourth of which have what are called "combing claws" with which the animals comb their fur. The hind feet are the chief means of propulsion in swimming. The front feet are not

Beaver Cuttings on Large Poplar; Note Size of Chips at Base of Tree

webbed and are not used at all in swimming, being held close to the body when the animal is in water.

The two large incisor teeth in each jaw are the tools with which the beaver does his woodcutting. At one bite a beaver will cut chips from a tree as large as would be cut by a large hatchet or small axe in the hands of a man.

Water being one of the prime requisites of its mode of life, the first thing a beaver does upon entering or being released on a given area, unless a pond is readily available, is to dam a stream. Branches are cut and placed on the bottom with the butt ends upstream; then mud, gravel, and frequently stones, dug from the bottom above the dam, are placed on the branches. Alternate layers of branches

Face of Beaver Dam

and earth are added until the dam reaches the desired height. Although the dam may leak at first, sediment washed against it will eventually make it water tight.

Considerable ingenuity is often displayed by beaver in selecting the dam site and in its construction. The dam pictured was built in the form of two adjacent arcs, one looping from a huge rock to two trees, the other from the trees to the shore. Before beaver are released at Debar Mountain a small dam is constructed to encourage the animals to locate in a given spot. The beaver usually proceed to enlarge it sufficiently to satisfy their purposes.

In one instance the caretaker laboriously constructed a dam six feet high and six feet thick, which leaked when finished. The beaver rebuilt it eight feet high, and four feet thick, and it did not leak! The beaver then built another dam downstream, backing water up against the first, thereby equalizing the pressure at the base on both sides of the dam and insuring its permanency. Farther upstream they built a third dam, apparently for water storage purposes.

As soon as the dam is finished, the beaver build a lodge (also called a house or hut) locating it completely in the water, against the shore, partially in the stream and the rest on the shore, or, in fewer cases, entirely on land. Lodges built in the water have entrance tunnels beginning well below water

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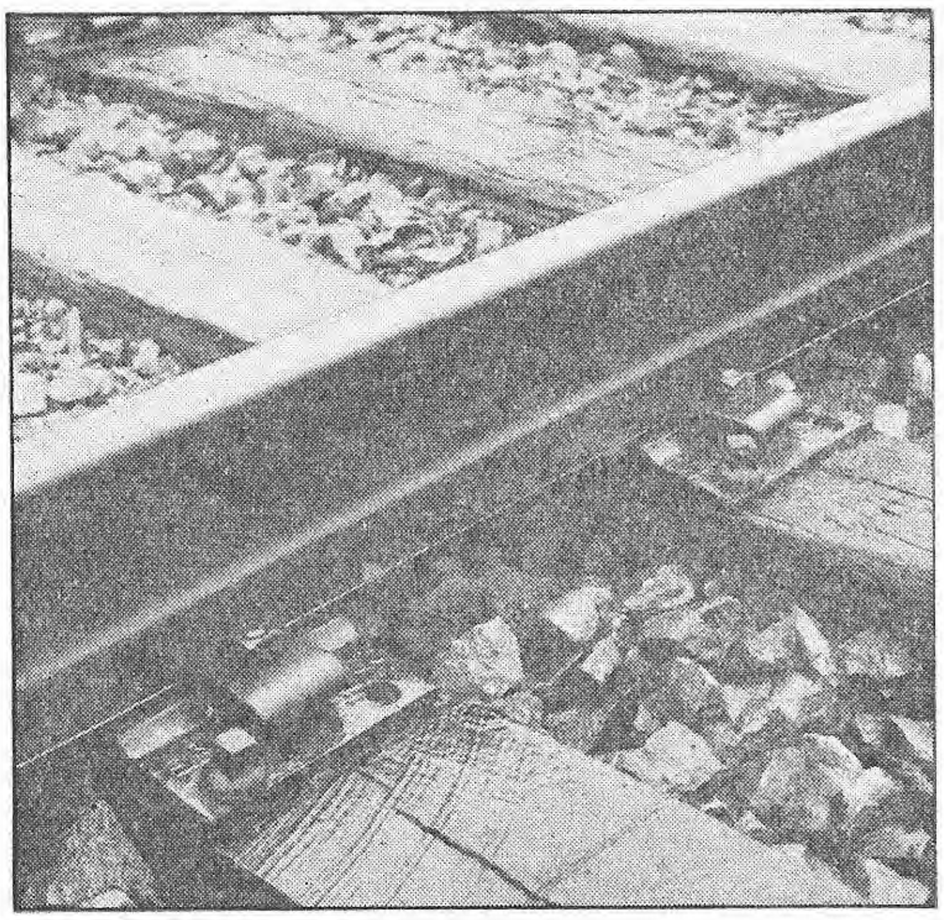


M. & L. Rail Fastenings

Modern Main Line

A Paper Presented at the Thirti

By H. S. CLARKE, *Engin*

IT may be said that most railroads appear to have taken steps to modernize permanent way in order to meet the present demands for higher speeds and bigger loads. It is, however, questionable whether the cost of track maintenance will not rise sharply under modern conditions of traffic unless comprehensive measures are taken where necessary to bring the standard of the track up to such a condition, with ample drainage, ballast and the most substantial construction of rails and ties, as to assure, without constant attention, a level surface and good alignment. Even though these means may have been purchased at a high cost initially, the safety secured and ultimate maintenance economy are justification.

To fit the track for these conditions, the strength of component parts must be increased so as to withstand the stresses induced by increased weight and the greater impact effect of higher speeds; alignment must be improved, and the general standard of up-keep raised, it being appreciated that the disturbing effect on moving cars of inequalities in alignment or surface increases as the square of speed.

Today we are in a situation where it is absolutely necessary to provide a stronger and better track structure than was ever before required and essentially one, that, due to the increased rates of pay, taxes, cost of material, and decreased traffic, can be maintained at approximately fifty per cent or less of the average that it cost the railroads to maintain their tracks between the years 1920 and 1930.

To meet this condition, radical improvements must be made in the standard track construction now generally used in America.

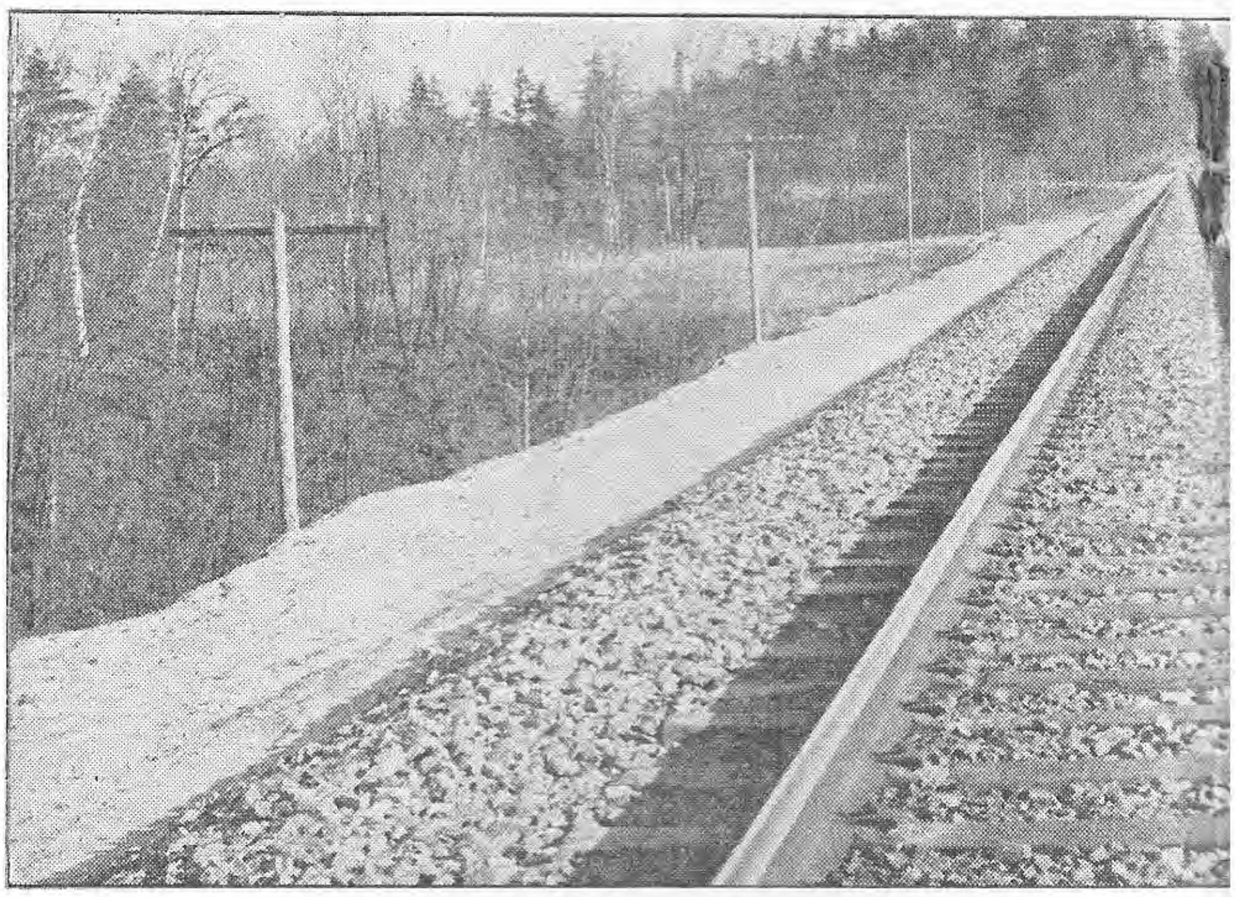
On The Delaware and Hudson Railroad, for some years, we have been endeavoring to anticipate these conditions by providing each year an increased mileage of well-drained track, ballast of suitable type, and adequate thickness; hardwood creosoted cross ties, switch ties, and bridge ties, increased weight of rail, steel ties for our yards, improved track fastenings, etc.

Even through the depression this program of improvement has been carried steadily ahead until, at the present time, we have:

175 miles of crushed stone ballast,
225 track miles of 130-lb. and 131-lb. rail,
150,000 steel cross ties,
50 per cent of all cross ties creosoted hardwood,
80 per cent of all switch ties creosoted hardwood,
47 per cent of all bridge ties creosoted hardwood.

With the exception of the steel cross ties, most railroads were taking the same steps to modernize their permanent way, and it was deemed necessary to go a long way further to meet the present demands, and, at the same time, maintain reduced maintenance costs. More radical improvements must be secured and we looked for the most outstanding features that might be improved.

1. While creosoted ties decrease the cost of tie renewals, by preventing the wood from decaying, the treatment is expensive and, to secure full advantage of the improvement, the tie must be fully protected against mechanical wear and spike-killing.



Modern Rock-Ballasted Track: Welded 130-pound Rail

: Permanent Way

ieth Annual Agents' Meeting

neer Maintenance of Way

2. The rail joint is universally recognized as the weakest point in the track, and if a joint could be as strong as the unbroken section of the rail, or if joints could be eliminated entirely, the problem of track maintenance would be greatly simplified.

3. It is universally recognized that over 45 per cent of track labor is now necessary in order to keep the rail joint in proper line and surface.

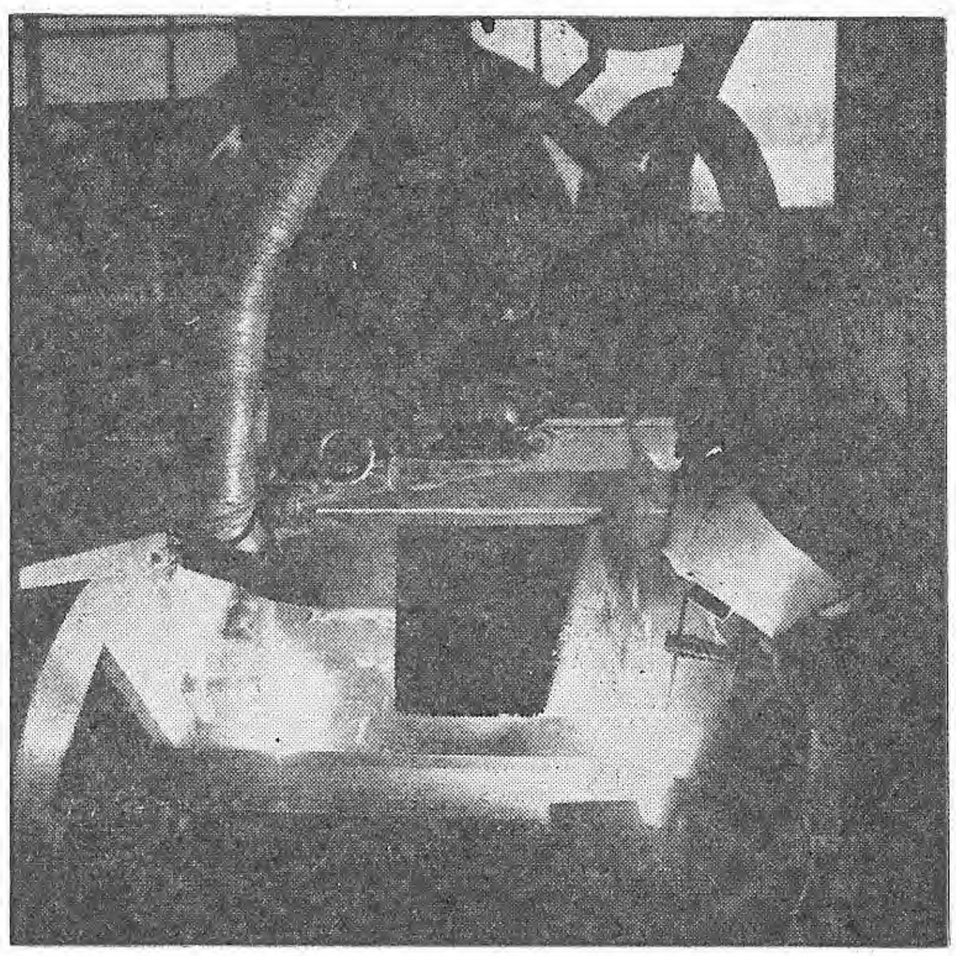
4. More rails are renewed yearly and have their service life shortened by reason of battered and chipped ends than for any other cause, thus constituting this as one of the major problems in maintenance work.

5. While new methods of hardening rail ends against batter, and a process of reconstructing or building up rail ends has been developed, these improvements are only stop-gaps and full service life of the rail is far from being secured.

6. If the rail joint were eliminated, tougher rails could be developed from the use of alloys, which would give longer service against wear.

7. The development of control-cooled rail eliminated many of the anticipated difficulties from transverse fissures developing in rails.

To meet the first condition, a heavy double-shoulder tie plate was developed, canted and crowned, fastened to the tie by means of a compression screw spike, independent of the rail fastenings, thus the tie plate became a part of the tie and prevented mechanical wear of the tie. The screw spike provides sufficient lateral resistance, the double-shoulder plate maintaining the track to gauge. In addition, high lateral forces set on the rail inwardly of the track as well as outwardly, and if the rail is held closely to place when the pull is inward by means of the shoulders, a decrease in the lateral force applied to the other rail will result and the side thrust will be divided more evenly between the two rails.



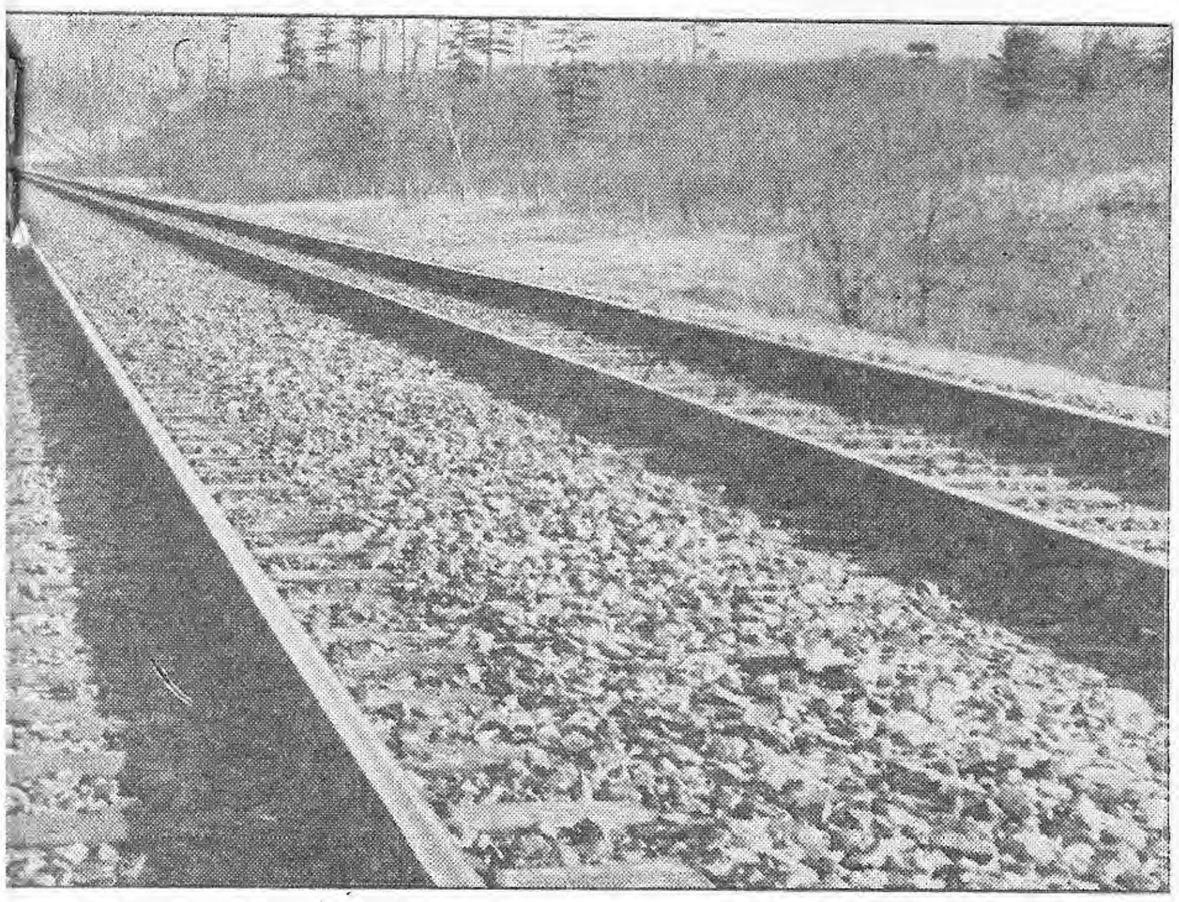
Welding Steel Ties

The fastening of the rails to the tie plate, it was felt, must meet certain conditions. Such fastenings must be able to be strongly tightened up and remain so in order to absolutely prevent rails creeping on the ties. They must have some elastic detail in order to dampen the effect of the stresses developed in the track, and the movement of the tie in the ballast from impact. It must be possible, at any time, even after a number of years, to tighten up the fastening, to take up wear, or renew part or all of the component parts.

After many experiments with various types of clip fastenings, the M. & L. fastenings, now used, were adopted; these consist of the double shoulder plate described, punched to take fastenings.

By these fastenings, the rail is held by means of two spring clips bolted to the tie plate at the center of the crown and bearing on the base of the rail. Since the rail-to-tie-plate fastenings are independent of the tie-plate-to-tie fastenings, each group is free to perform only the work it is designed to do.

(Continued on page 14)



ls. Secured to Creosoted Ties by M. & L. Fastenings

The
Delaware and Hudson Railroad
CORPORATION
BULLETIN

Office of Publication:
DELAWARE AND HUDSON BUILDING,
ALBANY, N. Y.

PUBLISHED MONTHLY by The Delaware and Hudson Railroad Corporation, for the information of the men who operate the railroad, in the belief that mutual understanding of the problems we all have to meet will help us to solve them for our mutual welfare.

All communications should be addressed to the Supervisor of Publications, Delaware and Hudson Building, Albany, N. Y.

Vol. 18 January 1, 1938 No. 1

Fame is a vapor, popularity an accident, riches take wings. Only one thing endures, and that is character.

—HORACE GREELY.

You Can't Do That!

YOU can't do that! Why, we've been doing it this way for 19 years!" was the rebuff which met a suggestion regarding a change in methods offered by one of our younger employes.

Granting that the railroad is a large and complex organization and that careful consideration must be given to any changes before they can be put into effect, nevertheless "the excuse can be worse than the crime." In other words, the reason given above for making no change in present procedure condemns the prevailing practice on the face of it.

True enough, there are some things which we still do just as they were done a score of years ago, but that is simply because no one has as yet figured out what can be proven to be a better way, not because the better way does not exist or cannot be developed. So many things have been improved in railroading in the past decade or two that very few people, even railroad employes, realize what has been done.

Streamlining, air-conditioning and the application of Diesel power are familiar to all. Less well known is the fact that the power of freight locomotives per driving axle has increased from 260 to 1,171, or 350% in 29 years. We might continue indefinitely citing improvements in the fields of motive power and car design, track maintenance, signalling and train operation. Improvements in dining service, sleeping car refinements and a thousand other things could be quoted if space permitted.

One large road recently developed a 4-cylinder passenger locomotive of advanced design. Now it announces the proposed construction of a 16-cylinder machine with 4 4-cylinder engines geared to the driving axles in such a way as to avoid the dynamic augment or hammering effect of the unbalanced rotating and reciprocating parts of the conventional locomotive which are so destructive to track at high speeds. On the Delaware and Hudson we have in operation a locomotive which has the first all-welded boiler for such service in the world.

Nineteen years ago neither would have been possible. Now each receives thoughtful consideration until tests prove its worth.

The standards of the transportation industry 19 years ago are outmoded. Any railroader knows that pre-World War standards of service and efficiency are "out." A new viewpoint and an awareness of the requirements of 1937, or 1938, traffic and operating conditions are imperative if railroading is to prosper.

"Speak Ill of No Man"

TWO men were discussing the unusual popularity of a third business associate when one remarked, "In all the years I have been connected with this company I have never heard anyone speak an unkind word about Mr. Blank."

"Did you ever stop to consider that you never heard Mr. Blank speak an unkind word about anyone else?" asked his companion.

Pausing for a moment to consider this simple explanation, the man admitted that he never had.

What finer tribute could possibly be paid to a man's character than that he had so disciplined his tongue that he kept silent rather than speak ill of anyone?

Benjamin Franklin had as a motto: "I will speak ill of no man, even in matters of truth, but rather excuse the faults I hear spoken of by others and upon proper occasion speak all the good I know of everyone."

The man who can put that principle into practice is assured of personal popularity and eventual success in any line of work.

Index Ready

AN *Index* listing all articles, illustrations and poems appearing in *The Bulletin* during 1937 has been prepared and copies will be sent free on request. Address: *The Bulletin*, The Delaware and Hudson Railroad Corp., Room 405-C D. & H. Building, Albany, N. Y.

Higher Rail Rates

Needed to Offset $664,000,000-Increase in Operating Expenses

EVERY American citizen, as well as every railroad employe, has a vital interest in the outcome of the Interstate Commerce Commission hearings on the railroads' application for permission to increase freight rates 15 per cent and raise passenger coach fares from 2 to 2½ cents per mile. If granted, these advances may mean continued employment for many railroad men whose positions are now in danger and re-employment for some who have been laid off in recent months. To the employes of and investors in firms which supply the 70,000 items railroads purchase in normal years at an average total cost of about $1,000,000,000, these increases would bring an estimated $500,000,000 increase in business with enhanced prospects of improved employe earnings and dividends. Millions of life insurance policyholders and savings account owners will benefit directly through interest and dividend payments which may follow the improvement in rail earnings which rate increases will produce. Refusal of the request may, on the other hand, have equally far reaching adverse effects on every American citizen.

Before considering the probable effects of the Interstate Commerce Commission's decision, glance briefly at the conditions which have made the request for rate increases necessary. Since May 1, 1933, there has been a 40 per cent increase in the cost of materials and fuel used by the railroads, amounting to $275,324,000. Legislation creating unemployment compensation and railroad retirement taxes have increased operating costs $80,586,000, after allowance has been made for pensions formerly paid voluntarily by the railroads. Restoration of depression wage reductions, together with recent increases, have added $308,879,000 to expenses. These three items alone have involved an annual increase of $664,789,000 in railroad operating expenses since 1933. Meanwhile, the railroads' tax bill, which includes items not covered in the above total, has risen from $249,623,190, in 1933 to $319,752,721 in 1936.

Despite this staggering annual drain on railroad finances, rate reductions since 1932 resulted in a saving to shippers of $464,000,000. The cost of moving a ton of freight one mile was reduced from 1.275 cents in 1921 to 0.974 in 1936, while passenger fares dropped from 3.086 cents per mile to 1.838 cents. If rail rates effective in 1921 had been charged for services rendered in 1936, the public would have paid $1,021,000,000, or 31 per cent more in freight charges, and $280,000,000, or 68 per cent more in passenger fares. This amazing performance was made possible only by greatly increased efficiency combined with strict economy measures.

The result of ever mounting operating costs coupled with reduced charges for services rendered has been reduced net operating income amounting to only 2.57 per cent of the investment in 1936, with a further drop to 2.47 per cent in the first nine months of 1937. This meager percentage is all that is left from revenues to cover the payment of interest on the railroad debt and other fixed charges before attempting to pay dividends, set up reserves, or make improvements in rail properties and equipment.

Expressed in different terms, the railroads earned 9.9 cents out of every dollar of operating revenue in 1930; 4.1 cents in 1936; and only 2.4 cents in the first nine months of 1937. As a result of the ever shrinking margin between operating revenues and expenses, 40 per cent of America's railroads operated at a deficit in 1936 and this percentage has increased to nearly 50 per cent in 1937. Already 96 railroads, operating 71,386 miles of track, or 28.1 per cent of America's total, are in the hands of receivers or trustees, the largest percentage in history.

If granted, what will these increases cost the American shipping and traveling public? Based on the 1937 volume of business, the advances, together with those recently authorized, are expected to produce $567,000,000 in additional revenues, or $98,000,000 less than the total increase in operating costs since 1933. The new freight rates would average only slightly more than 1 cent per ton mile of freight moved and less than 2 cents a mile in passenger coach fares.

Every American citizen's interest in the rate increase lies in the fact that in normal years the railroads buy more than $1,000,000,000 worth of materials for their operations, giving employment to, and thereby affecting the welfare of millions of employes of other industries. Their purchases averaged $1,184,000,000 in 1929 and 1930, but dropped to $559,000,000 for the years 1931 to 1935, inclusive. In 1936, they bought $803,421,000 worth of materials and supplies, only to

again be forced to curtail purchases in 1937 because of recent adverse developments.

Stated another way, the railroads buy 23 per cent of all the bituminous coal mined in the United States, 19 per cent of the fuel oil, 17 per cent of iron and steel produced, and 20 per cent of the timber cut. To maintain their standing as one of the nation's leading buyers the railroads must have money to spend.

Still another angle to the effect of railroad prosperity on that of the country as a whole lies in the fact that railroads spend for manufactured products annually a sum which almost exactly equals their net income. During the 8 years 8 months between January 1, 1929, and August 31, 1937, the railroads had total net railway operating income of $5,484,834,000, and spent $5,578,357,000 for manufactured products. Any increase which advanced rates produce in the net railway operating income will therefore result in the purchase of exactly the same amount of products of other industries.

Testimony delivered at the hearings by railroad managers has been to the effect that the increases requested will halt railroad failures; improve their credit; they will result in immediate increase in employment within and without the industry; they will add momentum to business and create a spirit of confidence that would get everybody moving forward. Refusal of the request would, they believe, render the railroads unable to give adequate service and remain solvent; will involve more receiverships and trusteeships; layoffs of railroad men and employes of other industries; and result in further curtailment of purchases.

The probable effect of the increases on commodity prices is summed up by *Railway Age* thus: "Railroad rates now average slightly less than 6 per cent of the value at destination of the commodities transported by rail. On the basis of this relationship, a general advance of 15 per cent in freight rates would be equivalent to a general advance of less than 1 per cent in commodity prices. Or, to state the matter otherwise, an advance of 15 per cent in freight rates would *impose no burden whatever upon the consuming public,* unless, in order to fully offset it the other industries of the country make an average increase of about 1 per cent in their prices."

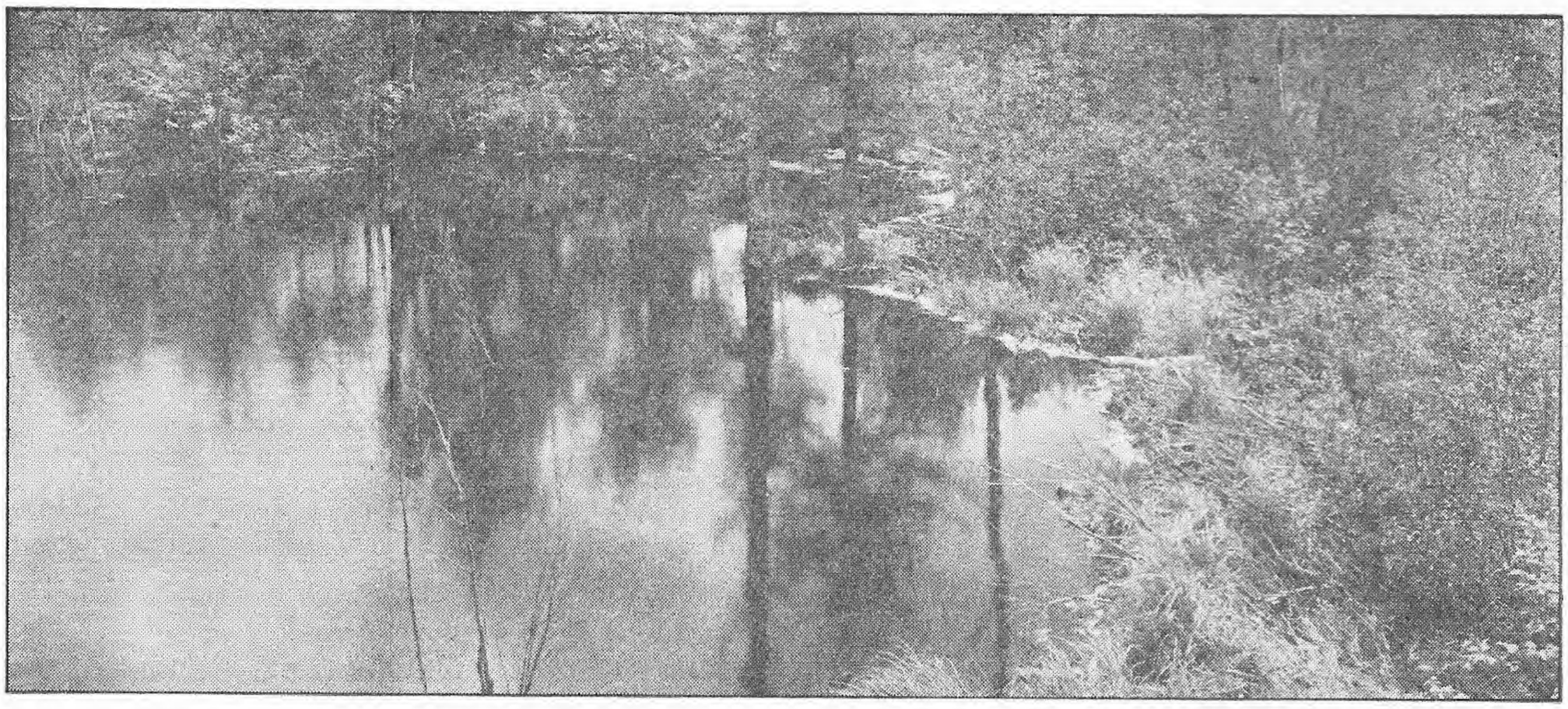
Beaver Dams Flood Branch

(Continued from page 7)

level so that the beaver will not be frozen in in winter, in which case they might die of starvation. The conical or bee hive shaped house is then built up of sticks and mud, the size depending on the number in the family. One lodge examined was 30 feet in diameter at the base, rose 8½ feet above the pond bottom, and had ten entrances, ranging up to 18 inches in diameter, most of them starting at the pond bottom and ending in rooms with ceilings one foot above water level.

Beaver live exclusively on vegetable matter, principally the bark of trees such as poplar, cottonwood, willow, alder, box elder, different species of birch, preferably yellow, wild and pin cherry, black and white ash, soft and bird's-eye maple. At Debar Mountain most of the recently cut trees were poplars, although pin cherry bark had also been eaten.

Once cut down, the trees and branches are "log-



Beaver Dam Showing Lodge in Upper Left Hand Corner

ged" or cut into equal lengths by the beaver, the pieces observed at Debar Mountain averaging between two and three feet long. These sections are then peeled and the bark eaten

The figure of speech, "busy as a beaver," apparently applies only in the fall. During the summer months the beaver cut only enough trees and bushes to fill their daily food requirements and perform only such other work as is necessary to repair the dam and lodge. When frost is in the air, however, they work frantically to cut and log enough trees to provide their winter's supply of food. The logs are dragged over clearly defined trails to the shore of the stream or pond and are stored in the water near the lodge. Eventually the heap will extend from the bottom to a pile well above water level. When ice prevents their going ashore they swim out of the lodge, return with a log, and gnaw the bark off, pushing the skinned log out of a tunnel. These water-soaked pieces float down to the dam and, in the spring, are pushed over the top to drop below and reinforce the structure.

Information on the family life of the beaver is somewhat meager because they mate and bear their young in winter when confined to the lodge by ice. Apparently they are monogamous and mate for life. The young, averaging three or four to the litter, are believed to be born in April and May after a gestation period of about three months. The young wean themselves at from six to eight weeks of age and begin eating bark. While it is generally believed that only one litter is born annually, some authorities have found indications of a second litter having been born in midsummer.

Beaver dams built along the Chateaugay Branch have frequently backed water up the tracks, plugged culverts, and otherwise proved troublesome to track maintenance forces. As there is no open season on beaver, except that at times when they become too numerous a limited open season is designated, New York State employs two men to trap beaver which are doing damage on private property and release them elsewhere. In a single year as many as 40 beaver have been removed from points along the Chateaugay Branch alone. Usually they are relased on state land, such as the Debar Mountain Refuge, although a surprisingly large number are liberated on private property at the request of the owners.

An interesting angle to beaver conservation work is the fact that once they are established in an area their dams and the resultant "beaver meadows" provide ideal breeding areas for wild ducks, muskrat, and later, mink and racoon. Furthermore, when a beaver dam is eventually abandoned, either because the food supply is exhausted or it is too full of sediment to be of further use to the animals, the fertile soil which has been deposited in it provides a fine growing place for various species of vegetation.

Authorities differ on the question of the beaver's intelligence: some insist that his activities indicate highly developed and complex instincts only, pointing out incidents to prove that in many respects he is most unintelligent. For instance, young beaver born and raised in captivity, if released in the wild, will immediately build a dam. Others who have seen the beaver's work are frequently amazed at his clever selection of dam sites, his ingenuity in building the dam itself, his digging of canals, tunnels, and the erecting of lodges, and credit him with near-human intelligence.

In his book, *The Beaver, Its Work and Its Ways*, Edward R. Warren sums up the question in this way, "In adapting itself to or taking advantage of circumstances it does just what a human engineer does when, before beginning the construction of a dam, for instance, he studies the surroundings, investigates the proposed site and the character of the underlying rocks or soil, and having gained this knowledge, plans his work accordingly, more elaborate and thorough than the beaver does, and more consciously done than the beaver's work, perhaps. But the main point is that each adapts itself to circumstances, and if in the case of the man this shows intelligence, why not also in the case of the beaver?"

Lake Ladore Excursions

(Continued from page 4)

weekday train running from Carbondale to Honesdale and return, thence to Wilkes-Barre and back to Carbondale.

MR. CHAPMAN is probably best remembered by Delaware and Hudson employes as the tall, genial conductor of the passenger train which made the 190-mile round trip between Wilkes-Barre and Nineveh weekdays, a position he held for the nine years prior to the discontinuance of this service September 30, 1935. His last run, which he held for the 20 months previous to his retirement, combined his two favorite types of service: he was in charge of Passenger Train No. 504 leaving Carbondale for Wilkes-Barre at 7 A. M., and returned with the local freight.

MR. and Mrs. CHAPMAN, who celebrated their golden wedding anniversary May 24, 1937, have one son, Guy, an Ontario and Western train dispatcher at Mayfield, Pa. They live at 113 Washington Street, Carbondale, spending the summer season at their other home at Waymart. MR. CHAPMAN is a member of The Delaware and Hudson Veterans' Association and the Masons.

Modern Permanent Way

(Continued from page 9)

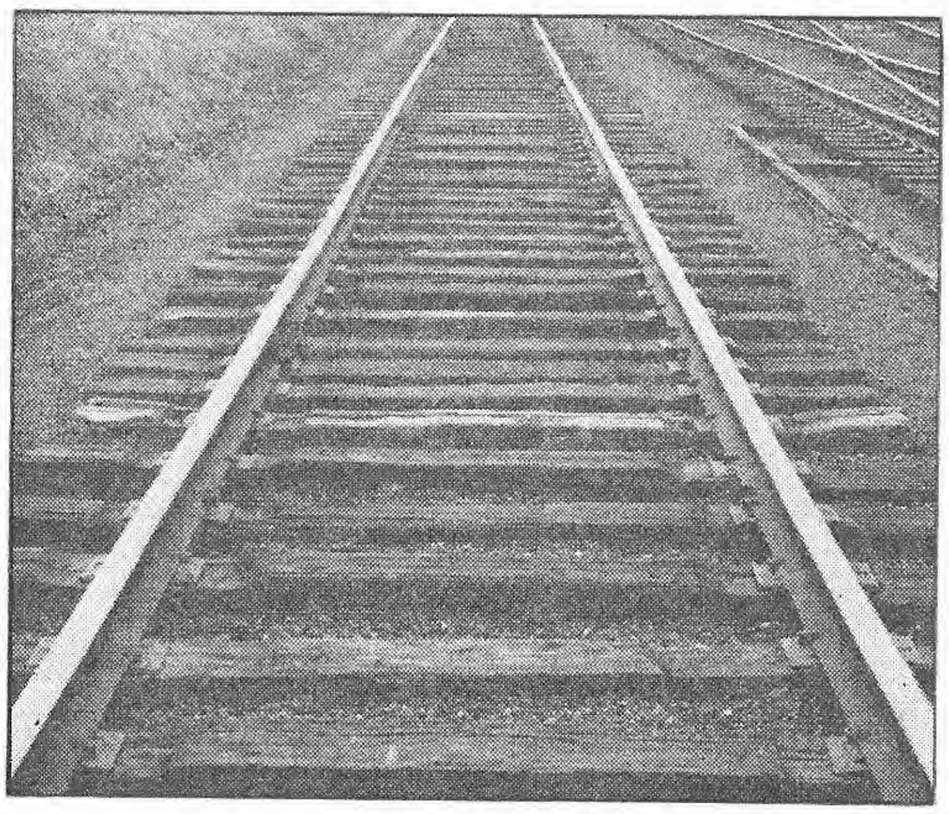
while the rail, the tie plate, and the tie are co-ordinated into one strong, but elastic and flexible unit. The old destructive cut spike is eliminated, the double-shouldered plate maintaining the track to gauge.

The fastening of the rail to the tie plate and through that to the tie by means of the spring steel clips, greatly strengthens the track structure, yet leaves it sufficiently elastic to absorb the impacts and loads applied to it. The vertical motion of the rail and of the tie is greatly decreased over that of the old cut spike, or cut spike and screw spike construction, although the normal wave motion of the rail is permitted to pass freely. The decreasing of the vertical motion of the tie means a lessened pounding on the tamped ballast structure beneath the tie, the incessant pounding or pumping of which breaks down the interlocked ballast, and causes the track to go out of line and surface. M. & L. track construction stays in line and surface for longer periods of time, resulting in a saving in labor charges.

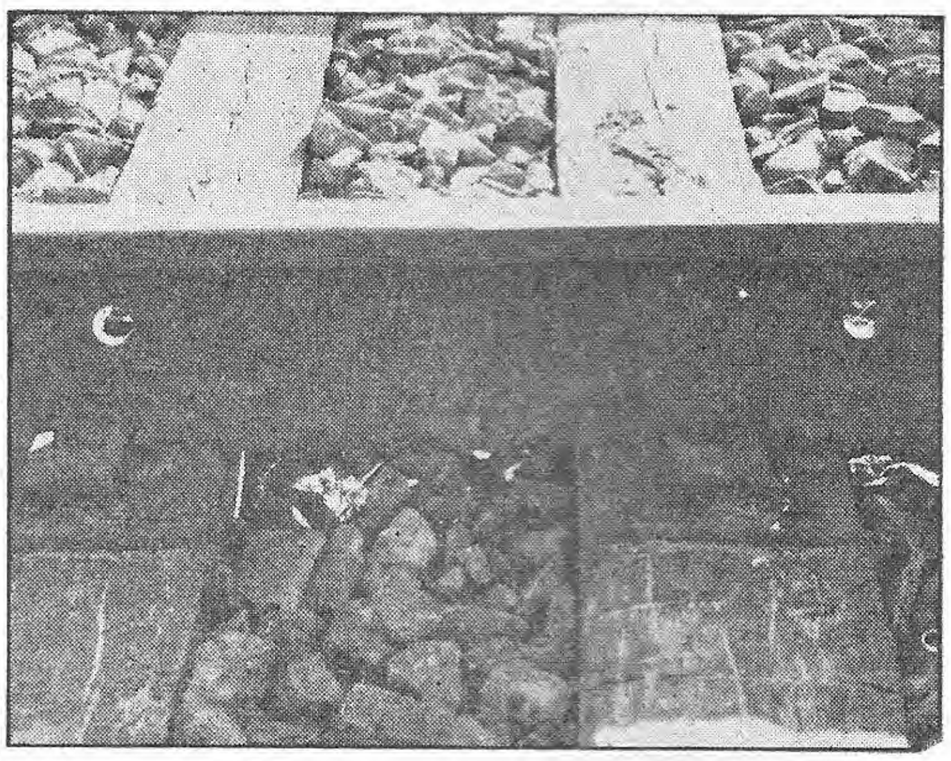
The further advantages of the steel spring clips of the M. & L. track are evidenced by the studies made of the vertical movement of the rail and tie as shown by many tests. It was noted in these tests of the relative motion of the rail to the tie, the M. & L. track remained substantially the same in all the tests, which is extremely indicative of the uniformity of this track structure.

In combination cut spike and screw spike track, this relative motion varies over a wide range and this will always be true of straight cut spike or cut spike and screw spike construction.

The pressure exerted by the spring clip permits



Cut Spike Track Construction



Flash-Welded Rail Joint

the free wave motion of the rail, but does not permit it to progress longitudinally. The rail is held in place and there is no creepage. So well is the rail restrained that changes in length due to expansion and contraction are prevented.

It was this feature of M. & L. construction, combined with several other facts that led to the belief that it was possible and practical to weld rails into long lengths.

The tendency to movement by creeping is caused by the running of trains and is always in the direction of the moving train. Where this movement takes place, it usually extends over comparatively long stretches of track.

The principal cause is the wave motion of the rail set up by moving trains. There is usually a slight upward and then a downward movement of the rail and ties just preceding a moving locomotive or train, owing to the flexibility of the rail. The whole ground also springs for quite a depth underneath the track and for some distance each side, so that there results a wave motion in the rail of much greater amplitude than at first appears.

Starting with the fact that there is a wave motion in the rail, it may be explained that if the rail were continuous, this wave would be propagated along it simply as an undulating motion and there would be no onward movement in the rail any more than there could be in the ground. But by laying rail in sections of 39 feet or other short lengths, the propagation of the undulating motion is more or less arrested at every joint (completely, where the angle bar is loose). Each section of rail is permitted to move ahead. Hence, running or creeping of rail takes place successively by sections, one section at a time; or, at most by a few sections acting together as one; and this is why steel may creep and not close the joints.

(To be continued)

Clicks from the Rails

Trains Have Been Flagged

with many things besides the red flags and lanterns prescribed by the rules, but few can match for oddity the incident at Bulls Gap, Tenn., where a Southern Railway freight made an emergency stop when the engineer saw a woman frantically waving her baby up and down in her arms. Just around the next curve the crew found a huge boulder on the track. Meanwhile, the woman, momentarily forgotten in the excitement, had walked away.

✣

"Different Job" Record

honors for railroad employes are claimed by G. J. Hardwick, of the M-K-T at Waco, Tex. In 24 years he has held 13 different jobs in 6 different departments; they are: clerk in the auditor's office, trucker, warehouse clerk, yard clerk, interchange clerk, night chief clerk, day chief clerk, brakeman, night freight clerk, relief yard master, dispatcher, and ticket accountant.

✣

A Fox Hunt

on the railroad recently occurred in Georgia. The animal, a big red one, had escaped from a crate in an express car at Atlanta, Ga., and had not been recaptured at leaving time. A hunting party, minus the usual horses and hounds, was arranged at Macon on the train's arrival. The fox was maneuvered into a corner and caught by an expressman who, incidentally, didn't suffer a scratch in the capture.

✣

A Box Car Fire,

involving 18 million matches—500 cases—gave Kansas City fire fighters some uncomfortable moments. Answering the alarm, firemen found there was no hydrant in the neighborhood. After emptying their chemical tanks without snuffing out the blaze, a switch engine pushed the car to a fire plug 14 blocks away. All but 60 cases were saved.

The Steam Locomotive

has a staunch supporter in the aged Bavarian peasant woman who hobbled up to the station-master to inquire when the next train left for a certain station. Smilingly opening the door of a brand new, motor-driven streamliner, the official beckoned her inside. Scornfully refusing to board the new unit, she insisted, "I've bought a ticket for a train and by a train I'll travel." No one could convince her that the streamliner was anything but an automobile, and the determined old lady sat down and waited for the next steam train.

✣

Asleep on the Track,

with his head resting on one rail and his legs sprawled across the other, a man was saved from certain death by the alertness of L. & N. Engineer Mulvaney of passenger train No. 51. The engine ground to a stop five feet from the man whose dreams obviously were strongly influenced by alcohol. Police removed him to a cell which though somewhat confining, was better than the morgue.

✣

The "City of Denver"

streamliner caught a trout in its headlight. When it reached Chicago, employes noticed two things: the headlight was broken and inside the shattered lamp lay a dead trout. The explanation was, as the train sped eastward at 80 miles an hour, an eagle zoomed into its path. In the collision the big bird fell, dropping the fish which shattered and entered the light.

✣

"The Wolverine"

was recently stopped west of Battle Creek, Mich., by a broken cylinder head. A telephone lineman working on a nearby pole, tapped an available circuit, gave the engineer's message to the yardmaster in Battle Creek, and another engine was soon on its way to replace the disabled one.

What Agent Can Match

the fast-loading record of the Pontiac, Mich., Railway Express force which put 174 pieces, weighing 12,190 pounds, inside a car in just ten minutes? Just before train time a motor car company asked the agent to get these shipments aboard the express car. The railroad agreed to hold the train 10 minutes only and the instant it stopped the entire force feverishly set to work. The last piece was pushed into the car just as the conductor, watch in hand, gave the engineer the signal to go.

✣

A New "Flash" Boiler

is being tested in France. Theoretically, water sprayed into it as a mist "flashes" into steam by instantaneous contact with the dry walls which have previously been heated to the desired degree. Its use for transportation purposes is claimed to be practical.

✣

Build a Better Mouse Trap

and the world may beat a path to your door, as the old saying goes, but unless there is additional business on the way, railroads will ignore you. That is the attitude of Burlington officials who have asked permission to abandon a 20.5-mile branch between Koyle, Iowa, and Cainsville, Missouri. The only industry on the line is a mouse trap manufacturing plant, which, according to the brief filed, is adequately served by trucks.

✣

A Grade Crossing Accident

in which a light coupe struck and derailed part of a freight train, resulted in less than $300 worth of damage to the autobile, but cost the railroad nearly $10,000. Included in the railroads' bill were charges for: 9,000 damaged ties, other materials, a $750 signal destroyed, repairs to seven derailed cars, wreck train operation for several hours, and other labor costs.

The New Year

A FLOWER unblown, a book unread;
A tree with fruit unharvested;
A path untrod; a house whose rooms
Lack yet the heart's divine perfumes;
A landscape whose wide border lies
In silent shade 'neath silent skies;
A wondrous fountain yet unsealed;
A casket with its gifts concealed—
This is the Year that for you waits
Beyond tomorrow's mystic gates.

—HORATIO NELSON POWERS.