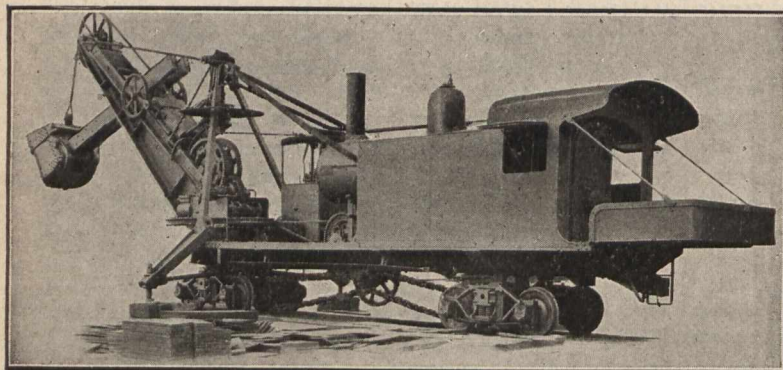


THE ROBINSON WIRE ROPE STEAM SHOVEL.

The great expansion that has taken place in power and capacity of locomotives and rolling stock of railways now finds its counterpart in the necessity for corresponding increase in power and capacity of the steam shovel. Ten years ago the standard railway shovel weighed 35 tons and carried a dipper of $1\frac{1}{2}$ cubic yards' capacity; now shovels are in use which weigh 90 tons and carry a dipper of 5 cubic yards' capacity. Mere weight and size, however, do not give efficiency in service. Great weight, which is necessary in a locomotive, is a disadvantage in a steam shovel, because it not only makes it cumbersome and difficult to hold up on temporary rails and soft ground, but makes it slow of movement.

The steam shovel illustrated herewith is a new machine which is being built in Canada by the Locomotive and Machine Co., of Montreal, and in the United States by the American Locomotive Co. from the designs of A. W. Robinson, C.E., Montreal. This machine is the result of many years' experience in the design and operation of steam shovels and dredging machines, and it includes all the desirable features of the best modern practice in shovel-building. The steam shovel has become an indispensable machine to railroad companies and contractors engaged in construction work, and the present machine has been brought out to meet the demand for a high-class shovel of greater speed, power and capacity. This shovel is built on locomotive lines, and the quality of the design and workmanship throughout is fully up to the best class of locomotive construction. This has not been the case hitherto with shovels built by manufacturing companies, whose aim has been more to keep the cost down to the lowest pos-



sible notch than to produce the best machine that can be built. The work which the steam shovel is called upon to do is probably the most severe and exacting of any mechanical appliance and as a rule it is handled by a class of men who are not careful engineers, and whose only object is to get the most work out of the machine regardless of consequences. A good shovel must be quick in its movements, easily handled, and very strong in all its working parts, and constructed so that it cannot get out of order with any kind of handling.

The Robinson wire-rope shovel has been designed to fulfil the following requirements, which are primarily intended to cover the conditions of modern railway work:

1. Simplicity of design with direct strain, and few and strong parts that will not break or easily get out of order.
2. The highest possible speed and power consistent with safe and effective working.
3. Avoidance of wear and breakage of chains and sheaves.
4. Moderate weight.
5. Better and more efficient boiler for easy steaming and economy of fuel.
6. The employment throughout of the highest quality of design, materials and workmanship, and fully equal to the best locomotive practice.

These and many other points will commend themselves to practical men. The shovel illustrated is one in use by the New York Central and Hudson River Railroad. It is a Class 38-16-2 $\frac{1}{2}$ machine. This means a shovel having a pull upon the dipper of 38,000 pounds, a clear height of lift of 16 feet, and a capacity of dipper of 2 $\frac{1}{2}$ cubic yards.

This system of numbering expresses at once any combination of these three elements in a shovel, and is more systematic than the use of arbitrary numbers or letters of the alphabet commonly employed, which do not mean anything.

The distinguishing feature of this shovel is the direct wire-rope hoist. In an ordinary machine a chain is used for hoisting which passes over six sheaves. Few persons appreciate the great loss in wear and tear to heavy chain used in high-speed hoisting. This loss amounts to at least 40 per cent, whereas the loss in the case of direct wire rope hoist does not exceed 10 per cent. In the Robinson shovel there is but a single sheave used for hoisting, and this of very large size. This single sheave, besides reducing friction, has the very important advantage of increasing the angle of lead to the bucket. This is a most important feature, as it determines the digging efficiency of the machine. It is of but little use to exert a heavy pull upon the dipper by means of the hoisting chains if the angle formed by these chains on the dipper handle is so acute as to produce but little effect. In this shovel this angle is increased to such an extent that the digging effect is practically doubled. In other words, the same work can be done at higher speed and greater power and with a smaller expenditure of steam and less strain upon the machine.

The construction of this shovel is such that about four to six feet more height of lift can be obtained with the same length of boom as compared with other shovels, and it is possible to construct machines with a clear height of lift of twenty feet which will work at fully as high speed as the lower lift machines of the old type. This is a valuable feature in the reconstruction of existing railroads, of which so much is being done at the present time to reduce the grades.

Referring to the illustration, it will be seen that the hoisting engines are incorporated in the base of the boom, so that the whole hoisting machinery revolves together. This leaves more room on the car for the boiler, which is made unusually long and of first-class locomotive construction. The weak point of most shovels is in the boiler, which is too small and too cheap for the work. The boiler on these shovels is 21 feet long, and built for a working pressure of 150 lbs. per square inch. For ordinary purposes the shovel is not enclosed by the usual box-car construction. This looks well when new, but in a few weeks becomes dilapidated owing to the severe work. In the Robinson shovel ample protection for the men is afforded, and everything is covered that needs to be covered and the rest is left off. There is no woodwork whatever about the machine; therefore it is practically indestructible. The speed of the machine is such that six dipper loads per minute can be made and maintained by the operator without difficulty or fatigue.

The Canadian Locomotive and Machine Co., Montreal, are building four of these shovels at their works at Longue Pointe, and intend to make up a number for stock.

MARINE NEWS.

The foundry building at the yard of the Collingwood Ship Building Co., Collingwood, Ont., is to be completed at once.

The Dominion Government is preparing to have a new steamer constructed for the quarantine service at Halifax, N.S.

The Allan Line officials have made arrangements with a New York wrecking company to attempt to float the steamer *Hibernian*, stranded near Codroy, N.F.

The three-masted schooner, *Ida Oleson*, recently lying at Alpena, Mich., has been bought by Capt. George Dunn, of Owen Sound, Ont., for the lumber trade on Georgian Bay.

A new steamer, named the *Annie*, for towing and general service on the Newfoundland coast, has been launched at Fogo, N.F. She is fitted with two sets of compound engines, 7 $\frac{1}{2}$ -in. and 13-in. cylinders, by 12-in. stroke, and will make 11 knots an hour.