

cation, all the flexible staybolts are also inserted. Likewise many of the boiler trimmings, such as pipe flanges, are fitted on.

On the completion of these steps, the boiler is moved on to the next stand, which consists of two wooden horses. In this stand, the boiler is kept in a vertical position. Here, the smoke-box is rivetted on, smoke-box trimmings

ished pieces, seldom covered the same ground twice, everything gradually working from the lay out floor at the far end of the shop, up to the erecting floor end. By the adoption of some such system as the one just described the operating costs of a plant are very materially reduced, the handling of the material from point to point being reduced to a minimum. The manage-

ably attached; these may be secured in any desired position by the nuts shown, these nuts passing through a wooden jaw and holding plate. Radial movement of the bolt is permitted by slots in this piece C. To force out the jaws on the piece B, there is a cone-shaped piece on a bolt in the same line as the motor stem, but invisible in the photograph, being inside of the pipe bearing

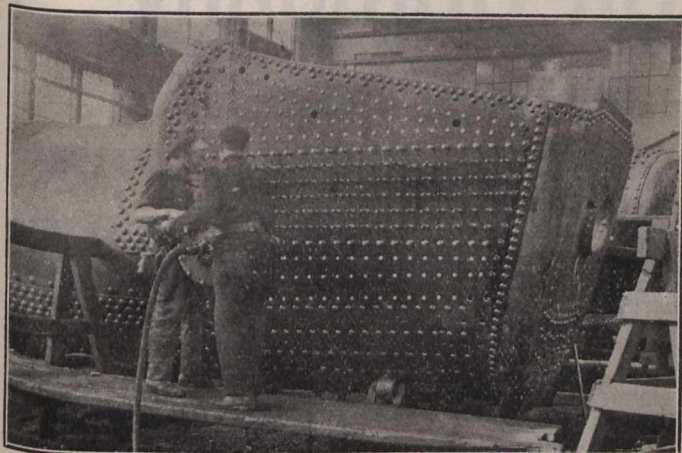


Fig. 9—Stand where the Boiler receives all the Staybolt Operations.

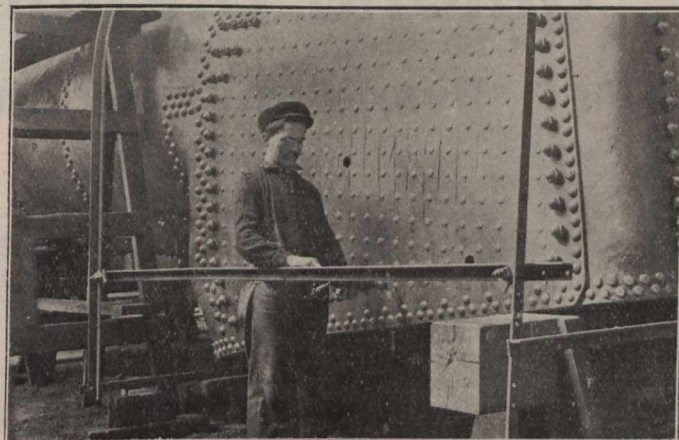


Fig. 10—Drilling Safety Holes in Staybolts with Simple Stand.

added, tubes inserted and beaded and the safety holes drilled in the staybolts in the manner indicated in fig. 10. The device for this consists of two hoop structures over the firebox with a cross piece between, against which the breast drill bears.

The boiler is now completed and is moved on to the next, which is the testing stand. Here all the pipe fittings and connections are attached, and the boiler subjected to a specified hydraulic pressure. This pressure is obtained by a powerful injector.

This end of the shop where the boiler

ment is to be congratulated on producing such a well designed shop.

#### Steam Pipe Kinks at the Pere Marquette St. Thomas Shops.

The idea of securing the throttle valve stand pipe while grinding in the valve, as shown in fig. 1, is due to H. Francis, who uses it for the purpose mentioned in the Pere Marquette Rd. shops at St. Thomas, Ont.

Ordinarily, the standpipe is stood up in some corner while the valve seats are being ground, a rather shaky support being thus obtained. When the operator tests the tightness of the fit, he is often unable to determine whether the "wobble" is due to the valve seats not being correct, or to the insecurity of the standpipe. This difficulty led Mr. Francis to devise this simple clamp. Two eye-bolts A pass through the brick wall on one side of the erecting floor, and are securely bolted, the eyes being on the inner side. Each of these longer eye-bolts has a shorter one, B, which hold the vee-clamp C over the stand pipe, tightening it up against wooden vee-blocks on the wall, securely holding the pipe. The standpipe being thus properly secured, it is quite possible to trace any looseness to its only cause—the poor fit of the valve seats. In addition to this advantage, the standpipe is made much more convenient for working upon.

Another kink, as developed by Mr. Francis, for use on the steam pipe, is illustrated in fig. 2. The Pere Marquette, like a few other roads, instead of casting the ball joint of the smoke box steam pipe integral with the end of the steam pipe, finishes the end of the pipe flush, and grinds a piece to this surface, this ball-joint piece having the ball face to give the ball and socket contact. This detachable piece is the piece A in fig. 2. The operation shown is the grinding together of this piece to the face B of the steam pipe.

To facilitate operations, a hole has been cut into the floor, into which the pipe is set on end. This feature is worthy of notice, as the curved pipe when stood up elsewhere always proved a menace to the workman's limbs. In this hole, the pipe is properly secured. The principal point in the device is the chuck for holding the ball piece A. It consists of a steel plate C, to which three wooden jaws D are slid-

on the inside of the jaws. A thumb nut on the bolt tightens up the cone, forcing out the wooden jaws. This makes a much neater and handier rig than is commonly used for such jobs.

J. Ellis Barker, writing in the Nineteenth Century, says, the average income of railway workers, exclusive of station masters, inspectors and clerks is \$5.62 in England and Wales, \$5.36 in Scotland and \$4.46 in Ireland.

**Railway Lands Patented.**—Letters patent were issued during August, cov-

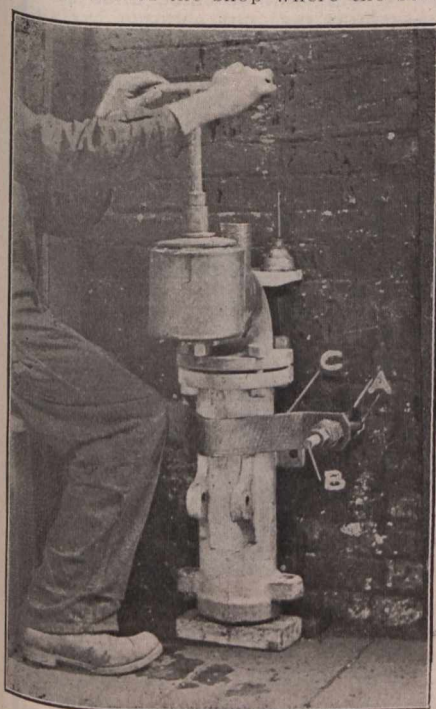


Fig. 1.—Throttle Valve Stand Clamp used in Valve Grinding.

is now located, is next to the erecting floor over to which it is now passed, to be built into the completed locomotive.

#### SUMMARY.

What impressed the writer most particularly in the gathering of this information, was the system that entered at every step. The reader will, no doubt, have noticed how the material and fin-

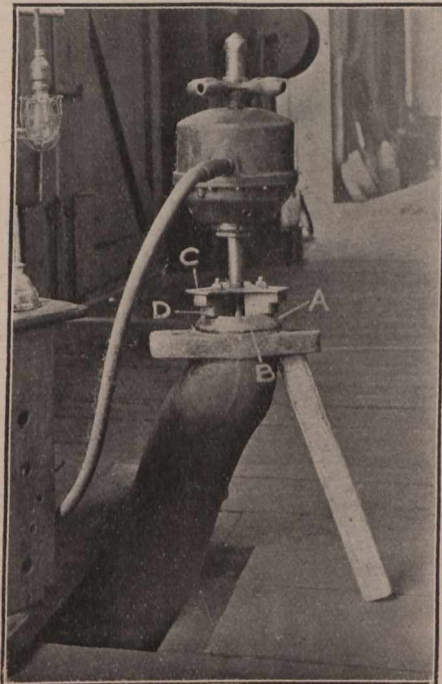


Fig. 2.—Grinding the Ball Seat in the Smoke-Box Steam Pipe.

ering railway lands in Manitoba, Saskatchewan, Alberta and British Columbia, as follows:	Acres.
Calgary and Edmonton Ry. ....	1,444.00
Canadian Pacific Ry. grants ....	1,281.46
Canadian Pacific Ry. roadbed and station grounds .....	2.04
Qu'Appelle, Long Lake and Saskatchewan Rd. and Steamboat Co. ....	160.00
Total .....	2,887.50